

# Revision of the European species of *Torymus* Dalman (Hymenoptera: Torymidae)

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In this revision the generic synonymy as proposed by Grissell (1976, 1995) is followed. The genus *Diomorus* Walker is here synonymised with *Torymus* as well, so that the tribe Torymini (sensu Grissell) includes only one genus in the West Palaearctic region. In *Torymus*, 154 species are recognised, 38 of which are here described as new. The existing types of nearly all names have been examined and 272 synonyms, 67 of them new, are listed. The genus is subdivided in 13 species groups, five species standing apart as species solae. Keys to the species groups, females and more distinctive males are presented.

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## Preface

In 1948 Graham took initial steps in a project to revise British Torymidae, work on this being carried out intermittently for many years, during which many types were examined and information collected. A first draft of a key to the species was prepared before 1951 and used as a basis. In succeeding years it was modified and extended to include European species. In 1970 he suggested to Boucek, who started the study independently, that a joint effort might be advantageous. This was taken up and some preliminary steps were taken but since 1972 Boucek's preoccupation with other studies prevented further collaboration. At this late stage the first author decided to go ahead with his own results, with the assistance of Gijswijt, who had taken a great interest in the group. In 1994, Graham published descriptions of ten new species of *Torymus* and Boucek indicated that he wished to validate a number of others, descriptions of which have been published since (Boucek: 1994, 1996).

M.W.R. de Vere Graham, Oxford 1994.

On the 27th of March 1995, Dr. M.W. R de Vere Graham died before he could see the final version of what is clearly his work. The major part of the research being completed, the second author has tried to finish the manuscript according to Graham's intentions, without too many alterations.

However, because more information has become available, a change of names became a necessity in several cases, a never ending pest in taxonomy. The status of *Diomorus* was a hot item in mutual discussions. The description of *Torymus pulcher* by Boucek (1996) made the separation of the two genera even more difficult and after all it appeared impossible to separate the two genera properly on morphological characters. I have synonymised the two (firmly welcomed by Boucek). This point, and the descriptions of a few new species together with some refinements in the keys are the main alterations that were made without the knowledge of the first author.

I feel the result would carry his approval.

M.J. Gijswijt, Ankeveen, August 1997.

## Introduction

The genus *Torymus* was described by Dalman in 1820. He included a key to the 22 females and the 6 males known at the time.

Subsequent works in the nineteenth century which covered Torymidae contained descriptions of *Torymus* species without any attempt at their systematic arrangement (Walker, 1833; Boheman, 1834; Nees, 1834; Foerster, 1840).

Foerster (1840) calls for a special remark. Boucek mentioned to the second author a little known publication on that work (Griffin, 1931), which clearly shows that the generally used "Beiträge zur Monographie der Pteromalinen" (Foerster, 1841), is not more than a reprint of the original work, which appeared in 1840 as a part of the "Programm zu der am 14. und 15. September 1840 in der kombinierten höhern Bürger- und Provinzial-Gewerbschule zu Aachen etc.". The 1841 reprint differs from the first edition in the numbering of the pages. In 1841, a title page and a blank, both without a page number precede the original text. The first printed page (also without a num-

ber) is now page 3, instead of I in 1840. The following pages bear the numbers 4-46 (in Arabic) instead of II-XLIV in 1840. In both editions the "Erklärung der Tafel" is provided with page number XLV. Mayr (1874) obviously saw the original publication: he refers to "Foerster 1841", but used the (Latin) page numbers of the 1840 edition.

In the 1841 edition there are two pages numbered 31. The second should bear 33.

Important advances were made by Mayr (1874) and Thomson (1876). Mayr's descriptions of the species are generally more detailed than Thomson's but there was no attempt at grouping: he arranged the species according to the relative length of ovipositor. He interpreted some of Foerster's species but evidently had not seen others, as evidenced by the absence of a page number against them in his index. When Mayr wrote his paper of 1874 he did not have access to all Foerster's types and missed some of the latter author's species. However, after Foerster's death in 1884 he bought the remaining collection (except the species described by Foerster in 1878, which went to Berlin), so that now most of the Foerster species are in Vienna. Also, Mayr could examine only a limited number of Boheman's species and could not avoid a few errors in their interpretation, as pointed out by Thomson (1876). Thomson arranged the Scandinavian species in groups and, having examined most of Boheman's material, his interpretation of Boheman's species is more reliable. Walker (1874a) reported on Mayr's work.

In 1914 Schmiedeknecht produced a key to the females, based on the descriptions of the previous authors.

The next important work was that of Ruschka (1921). It only consists of descriptions (which are good) of many new species. Some new characters were used, the most important one being the ratio of the projecting part of the ovipositor to the length of the hind tibia.

Hoffmeyer's main work (1930c-1931) contains keys to females of *Callimomus*, *Syntomaspis*, *Lioterphus* and *Torymus*. It is essentially a compilation and it relies heavily upon colour characters which, in many species, are quite variable. His key was used for several decades and during that time, with few additions or changes, was republished in Russian (Nikol'skaya, 1952) and in Hungarian (Erdős, 1960). Also more recent keys by Nikol'skaya & Zerova (1978) and Sellenschlo & Wall (1984) are based on Hoffmeyer's. Otherwise since Hoffmeyer's time no original comprehensive key to the European species of *Torymus* (s. lat.) has appeared, though other studies have contributed to unravelling of the confused state of the taxonomy. Eady's (1959) paper was particularly valuable for its analysis of the species described by Walker (1833, 1834, 1836). A significant discovery made by Eady was the dimorphism occurring in *T. auratus* (now *pallipes*): a seasonal difference in females, those of the hibernating generation having a markedly longer ovipositor than those of the summer emergence. This feature was discovered by Graham in another species and is suspected to occur in at least two others.

Graham (1969) indicated the usefulness of a character of the hind coxae (dorsal surface pilose in basal half, or bare). This character has proved reliable in many European species, very few being variable in this respect and easily catered for in a key. The character was adopted by Grissell (1976) for the North American species. Grissell's work was a great advance on previous studies. The inclusion of *Lioterphus* and *Syntomaspis* in *Torymus* is a logical step and it avoids the inconsistent placing of

some species in previous works. He introduced the character of the ratio between the intermalar space (= mouth-breadth of the present paper) and the malar space, which had been used earlier in other groups but not in *Torymus*. It is used in our paper, though not easy to measure in all specimens.

The work of Sellenschlo & Wall (1984) is essentially a compilation. The authors perpetuate a number of nomenclatural errors, although these had been pointed out earlier by Graham (1969), Grissell (1976) and Boucek (1977), whose papers they cite. This is particularly unfortunate because many of the host-records included are clearly incorrect, whilst others are dubious. Furthermore, there is no reference to several species described by Walker (1836), Nees (1834), Förster (1840) and other authors, so that the species list is incomplete.

Recently, Grissell (1995) published an outstanding study on the Toryminae of the world (including the former Monodontomerinae, Thaumatoryminae and Toryminae). He redefines the subfamily with keys to the tribes and the genera. As far as the European Torymini are concerned, only *Torymus* and *Diomorus* are included. Except for the genus *Torymus* there is a catalogue of the species with synonymy, biology, distribution, phylogeny. For *Torymus* he provides "only" a species check list and the synonymy for the 483 (!) nominal species names.

As some described *Torymus* species are still wrongly interpreted and many undescribed European species are known to us, there is a pressing need for a new assessment. At present, it is not possible to identify more than half of the European species from existing keys (Hoffmeyer, 1930-1931; Nikolskaya & Zerova, 1978). A revised key to the females, a key to a number of males and a key to the species groups are presented here, which it is hoped to update the existing data. It was not possible to give redescriptions of all the species. Instead in the keys additional characters are mentioned to facilitate the recognition. These characters are placed between brackets: [ ].

We realise that the identification of all caught specimens will still be impossible: especially the species associated with broom species (*Cytisus* and *Genista*) and *Salix* need more investigation.

### Host-relationships

A number of *Torymus* species appears to be monophagous and associated with only one host-plant. Some attack several hosts upon one host-plant, or on different host-plants belonging to the same genus (*T. auratus* on *Quercus* spp.). Various species are believed to attack a number of hosts upon plants of different genera (e.g. *T. calcareatus*, *chloromerus*, *phillyreae*). Dimorphic forms considered to belong to *T. chloromerus* attack different hosts upon unrelated plants at different times of the year.

Many species have been named after their host-plants (e.g. *T. corni*, *tanaceticola*) and there has been a tendency to assume that those are host-specific. This is sometimes the case, though not always. To make it more complicated, we know two species, belonging to different groups, which attack the same host species on *Filipendula*. All this results in an ambiguous taxonomy, and one has to be on the lookout for such complications.

In general, a given species tends to limit its attacks to hosts of a given family, e.g. Diptera Cecidomyiidae or Hymenoptera Cynipidae but some cases are known of species that attack hosts in both groups, usually on the same plant species.

At least some species are not completely zoophagous. Askew (1961) described the immature stages of *Torymus cyaneus* Walker, and mentioned that the *Torymus* larva feeds on the tissue of the gall and lives alongside the *Cynips* larva. As the cynipid larva disappears at a given time, Askew concluded that it has been eaten by the *Torymus*. Gijswijt found a possibly similar case in galls of *Rabdophaga salicis*. In early spring the cavities containing full grown larvae of *T. tipulariarum* and *T. partitus* did not contain remnants of a gallmidge. Moreover the cavity itself was much larger than those containing midge larvae. It looks as if these *Torymus* species feed on the gall tissue after having eaten the midge larva. There is a need for more critical rearing of *Torymus* in order to verify the host precisely.

With respect to Cecidomyiidae, which serve as hosts to a great number of *Torymus*, the opinion of Barnes as quoted by Nijveldt (1969:160) is important: "... too much importance has frequently been attached to the plant of which they [Cecidomyiidae] live, and in some cases to the particular kind of gall from which they have been reared. And, although larvae in addition to adult midges usually have been available, too little emphasis has been placed on the cooperative morphological approach to the species problem. This bias towards describing a gall midge from each different plant or gall as new served a useful purpose when comparatively few gall midges had been discovered. Frequently an indication of the host-plant was given in the trivial name.... But two beliefs grew up: firstly, that each gall midge species was either restricted to one food plant or to a few plant species in the same genus, and secondly that each species lived in a particular type of gall on a particular part of the plant and only occasionally inhabited more than one such type of gall."

Fortunately, the authors have been helped by the work of colleagues in the Netherlands in particular Nijveldt and Vlug, on Cecidomyiidae. However, much remains to be done on the precise host-relationships of many *Torymus*, associated with, for example, *Salix* or a number of species in the Asteraceae (Compositae). To a large extent our knowledge is linked to the elucidation of this aspect in Cecidomyiidae.

### Immature stages

Publications dealing with the immature stages of *Torymus* are rare. Cushman (1916) described and figured the egg and the first and last instar larva of *T. druparum*. Parker (1924) described in detail and figured the egg and first and last larval instars of a *Torymus* reared from *Asphondylia sarothamni*. Askew (1961a) described the egg and the first and last larval instars of *Syntomaspis* (now *Torymus*) *cyanea*. In addition, he noticed that the full-grown larvae of *T. cyaneus*, *apicalis* (now *affinis*), *notatus* and *varians* are very similar.

In his 1979 thesis (not seen), Sellenschlo seems to have summarised the morphology of larvae of Torymidae. In 1983a, he mentioned differences between eggs of zoophagous species of *Torymus* and phytophagous species of *Megastigmus*. A general description of torymid larvae and a comparison of larval characters of the two genera was given. In 1984, Sellenschlo reiterated the descriptions of 1983 and, contrary to Askew, noticed distinctive characters of *Torymus cyaneus*, *cerri* and *affinis*.

### Morphological characters

In general the most useful characters are: shape of head, relative proportions of temples, eyes, malar space and mouth; size of ocelli (to some extent), proportion and pilosity of hind coxae, relative length of antennal scape, to a lesser extent shape of the anellus; presence or absence of scutellar frenum; sculpture of mesoscutum and scutellum; sculpture of propodeum in some species; size and shape of mesepimeron; pilosity of forewing costal and basal cells, size of speculum, relative length of postmarginal vein; relative length of ovipositor sheaths, pilosity of hypopygium.

Relative lengths of funicular segments of antennae are useful in some cases, though in many species (as pointed out by Grissell) the segments are too variable to be useful, large specimens of a given species having longer segments than small specimens.

Dimorphic females are known in a few species, in which the length of the ovipositor sheaths is different in alternate generations. Some other cases are suspected but cannot be proved at present. In one species (*genisticola*) the length of the ovipositor sheaths differs in geographically remote places, in two others (*galii*, *tipulariarum*) two forms emerge from one species of galls.

Puncturation of the mesoscutum and scutellum is sometimes a useful character, though in a number of species it varies quite considerably, to some extent at least with body-size. In *T. phillyreae* for example, large females have the punctures of the scutellum very numerous, moderate-sized, separated by at most their diameter, sometimes rather less; the smaller females have these punctures progressively smaller and separated somewhat more than their diameter. Large *T. curtisi* females tend to have larger and more conspicuous punctures whilst very small ones have minute and inconspicuous punctures.

Dentition of ovipositor and male genitalia have been studied but no useful characters have been found.

### Abbreviations, terminology and measurements (figs 1-10)

Most of our terminology in the main follows that of Grissell (1976: 5-6 and 1996: 348-350), with the following exceptions:

Clava: (= club of Grissell)

Funicular segments: (= flagellomeres of Grissell)

Lower face: used for area below antennal toruli, and bounded laterally by the orbits and malar sulci.

Upper face: area between lower edge of antennal toruli and anterior ocellus, defined laterally by the inner orbits.

Malar space: (= malar distance of Grissell)

Mesepimeron: (= lower mesepimeron of Grissell, 1995)

Mouth: (= intermalar distance of Grissell)

Ovipositor index: the ratio length of ovipositor (fig. 9):length of hind tibia(fig. 8).

The morphological terminology is explained in de figures 1-10.

The scape is illustrated in as exact profile view as possible; for this reason in the drawings it is shown detached from the rest of the antenna, which lies in a different plane.

The pedicellus is measured in dorsal view; funicular segments and clava in lateral view.

Points of particular importance for measurements of the head in dorsal view: it is essential to orientate the head in such a position that the occipital surface just disappears and the observer is looking down vertically on the ocellar triangle. This is necessary to obtain a correct view of the outline of the temples and their relative length compared with that of the eyes. In measuring head-breadth to length it is also essential to have the head in such a position that the occiput surface is not visible (see figs 1 and 2).

Care is needed when measuring the ratios POL:OOL:OD. Doing this the head must be turned so as to bring each surface to be measured at right angles to the line of sight. Thus after measuring POL, the head must be tilted slightly sideways so as to measure OOL on the surface.

The length:breadth of an eye cannot be measured in exact profile of the head, as is sometimes done; the eye must be orientated in such a way that the maximum breadth can be measured. Similarly, the malar space has to be measured with the head in a different plane from that in which the eye-length is measured.

The most important feature, which always should be measured, is the length of the ovipositor sheaths relative to the length of hind tibia, first employed by Ruschka (1920) (figs 8, 9). This measure is preferable to comparing the ovipositor sheaths length with that of the gaster, which is not a rigid structure.

In general: only with precise measuring species can be identified with the key. The smallest inaccuracy can make a significant mistake; in particular, the lengths of malar space, mouth, OOL, POL and OD require much attention. Even if all characters are taken properly, it may appear not to fit any of the species mentioned in the key. There are two possibilities then: either there is another new species (which can only be decided by an expert), or the characters are more variable than assumed. The best way to study the genus is rearing as much as possible to obtain a basic collection of defined species.

In the figures the magnifications are: head 50 ×, antenna 100 ×, if not otherwise stated. Other parts are not defined.

Until now we only rely on morphological characters. Courtship behaviour, studied by van den Assem (pers. comm.) appears to reveal little differences in display motor patterns between species. Other possibilities have not been worked out yet.

#### Abbreviations used:

BMNH	The Natural History Museum, London, UK
DEI	Deutsches Entomologisches Institut, Eberswalde, Germany
FI	Forstinstitut Wien, Austria
FFB	Forestry Faculty, Belgrade, Yugoslavia
HNHM	Hungarian Natural History Museum, Budapest, Hungary

KJH	Collection Karl-Johan Hedqvist, Vallentuna, Sweden
MCSN	Museo Civico di Storia Naturale, Genova, Italy
MHNB	Muséum d'Histoire naturelle "Gr. Antipa", Bucarest, Rumania
MJG	Collection M.J. Gijswijt, Ankeveen, The Netherlands
MHNG	Muséum d'Histoire Naturelle, Geneve, Switzerland
MNHN	Muséum national d'histoire naturelle, Paris, France
MNCN	Museo Nacional de Ciencias Naturales, Madrid, Spain
MVMA	Museum of Victoria, Melbourne, Australia
MZH	Museum of Zoology, Department of Zoology, Hamburg
NHMW	Naturhistorisches Museum Wien, Austria
NMI	National Museum of Ireland, Dublin, Ireland
NMP	Národní Muzeum Prague, Czech Republic
NR	Naturhistoriska Riksmuseet, Stockholm, Sweden
OUM	University Museum Oxford, UK
RMNH	Nationaal Natuurhistorisch Museum Leiden, The Netherlands
SFI	Museum La Specola Firenze, Italy
TM	Természettudományi Múzeum, Budapest, Hungary
ZB	Collection Z. Boucek, Flackwell Heath, UK.
ZIL	Zoologiska Institutionen, Lund, Sweden
ZMA	Zoologisch Museum Amsterdam, afd. Entomologie, The Netherlands
ZMHU	Zoologische Museum der Humboldt Universität, Berlin, Germany
ZMK	Zoologisk Museum København, Denmark
ZSM	Zoologische Staatssammlung, München, Germany

### Rearing and mounting

Reared material is indispensable. It is essential that rearing be carried out with care: unexpected potential hosts may be hidden in or under galls.

Specimens should not be killed immediately but allowed to rest for one or two days until the cuticle hardens, otherwise distortion may occur. They should never be allowed to die as this results in distortion and they may become intractably stiff. Most *Torymus*, when killed by ethyl acetate vapour, preserve the normal state of the head, which is of great importance for the recognition of species. They may also be relaxed in water saturated air after drying.

Mounting was described in detail by Noyes (1982). In short, the specimens are glued on white rectangular cards with a small drop of water soluble glue. They are orientated on their side (the right-hand side according to Noyes: may be because most people are right-handed), and slightly tilted so that the longitudinal axis has an angle of about 30° with the card. It is essential that the thoracic pleurae, the dorsum of mesosoma and the head frontally as well as dorsally can be observed.

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Without the help and encouragement of these and of many other people it would have been impossible to complete this work.

### Definition of subfamily, tribe and genus

The definitions we use are essentially those of Grissell (1976, 1995) to which we refer. In short: in the Torymidae only two subfamilies are recognised: Megastigminae and Toryminae. The latter being characterised by the subquadrate or broader than high stigma of the forewing. In the Toryminae the members of the tribe Torymini have the metapleuron with an anterior margin which is distinctly produced.

In the tribe Torymini Grissell, 1995 we currently recognise only one genus being represented in Europe: *Torymus* Dalman.

The Nearctic genus *Allotorymus* Huber, 1927 comes very near to *Torymus*. Its type-species, *Syntomaspis splendens* Provancher, 1887 differs from *Torymus* species mainly in its long, virtually parallel-sided pronotum. Its mandibles have the form seen in the *laetus*-group of *Torymus*; the ocelli are very small; the forewing has an extremely narrow costal cell; its frenum is more or less offset and the scutellar base is pointed. These characters are partly shared by the *laetus* - and *austriacus*- groups of *Torymus*.

### Genus *Torymus* Dalman, 1820

*Callimome* Spinola, 1811: 146-148. Type-species: *Ichneumon bedeguaris* Linnaeus. Designated by Curtis 1835:552.

*Misocampe* Latreille, 1818: 213. Type-species: *Ichneumon bedeguaris* Linnaeus. Designated by Gahan & Fagan 1923:91.

*Torymus* Dalman, 1820: 135, 178. Type-species: *Ichneumon bedeguaris* Linnaeus. Designated by Ashmead 1904:242.

*Misocampus* Stephens, 1829: 395 [misspelling].

*Diomorus* Walker, 1834: 159. Type species: *Diomorus nobilis* Walker 1834: 159 (now *T. armatus* Boheman). Monotypic. **Syn. nov.**

*Syntomaspis* Foerster, 1856: 43-44. Type species: *Torymus eurynotus* Foerster (now *T. cyaneus* (Walker)). Designated by Gahan & Fagan 1923:139.

*Callimomus* Thomson, 1876: 60, 77. Type-species *Callimomus scaposus* Thomson. Designated by Ashmead 1904:241.

*Lioterphus* Thomson, 1876: 60, 99. Type-species *Torymus pallidicornis* Boheman (now *T. nitidulus* Walker). Designated by Ashmead 1904:241.

*Hemitorymus* Ashmead, 1904: 243, 400. Type-species *Hemitorymus thoracicus* Ashmead. Monotypic.

Comments: *Callimome* Spinola and *Misocampe* Latreille: permanently suppressed by the Intern. Commission of Zool. Nomenclature, Opinion 155: 1944.

*Syntomaspis* Foerster, *Callimomus* Thomson, *Lioterphus* Thomson and *Hemitorymus* Ashmead were synonymised with *Torymus* by Grissell (1976: 10). We agree with Grissell in his summary of the status of the entities included in our generic synonymy above (previously regarded as genera).

*Diomorus* Walker: it is not possible to distinguish *Diomorus* from *Torymus* on morphological characters. Especially the type species: *D. nobilis* Walker is extremely close to *Torymus*. There is an overlap in the single character used until now: a tooth on the ventral side of the hind femur. *T. fastuosus* in the Palearctic has sometimes a small tooth, *texanus* in the Nearctic is provided with a full grown tooth as in *Diomorus*. The recently described species *T. pulcher* Boucek looks as an intermediate between *Torymus* and *Diomorus*. Moreover *Diomorus* seems not to be a homogeneous group as Graham (1992a) noticed. He keyed out the two genera, but on a world basis the characters used are not sufficient. At the moment it is not possible to give an overview of the species of this genus on a worldwide scale. The three species in Europe fall into two different species groups as will be explained in chapter "subdivision of the genus *Torymus*". The eleven extralimital species of *Diomorus*, listed by Grissell (1995) should be referred to *Torymus*.

*Hemitorymus* Ashmead: synonymised by Gahan (1948).

### Subdivision of the genus *Torymus*, with a key to the species groups

We did not find it useful to recognise subgenera. A number of species groups are defined, some of them well established, others more difficult to delimit, while a few species remain as "species sola". Graham tried to elaborate the phylogeny of the species groups as recognised here. It is clear that one cannot speculate fruitfully, until the validity of certain entities is well established: some of the species groups may better be subdivided, the status of several species, e.g. *T. chloromerus*, *phillyreae* and *galii* is still problematic.

#### Key to species groups (based mainly on females)

- 1 Metatibia with one obvious apical spur. Antennal flagellum of both sexes clavate; F1 anelliform; male scape in one species expanded. Scutellar frenum indicated by

- an area devoid of setae but not delimited anteriorly by an impressed line. Metacoxa elongate, bare dorsally in basal half. Hosts: *Semudobia* species (Cecidomyiidae) on *Betula* ..... *T. nitidulus*-group  
*T. fuscicornis* (Walker), *nitidulus* (Walker).
- Metatibia with 2 apical spurs. Male with antennal flagellum filiform or at most very weakly clavate; F1 not anelliform, scape not expanded. Scutellar frenum absent or present. Metacoxa normal or elongate, bare or pilose in basal half. Not parasites of *Semudobia* on *Betula*. ..... 2
  - 2 Mandible with at most 2 teeth. Antenna (figs 24, 135) with F1 proximally not or hardly broader than anellus, the latter quadrate or slightly elongate (except in some *ventralis*). Propodeum more strongly sculptured (figs 125, 138). Metacoxa most often bare in basal half. Scutellum with frenal area not delimited. Host, so far as known, on *Carex* species ..... *T. laetus*-group  
*T. arcticus* (Thomson), *chrysocephalus* Boheman, *cyprianus* spec. nov. *fischeri* Ruschka, *grahami* Bouček, *igniceps* Mayr, *laetus* (Walker), *regalis* (Walker), *scaposus* Thomson, *ventralis* (Fonscolombe).
  - Mandible with 3 teeth, the inner tooth smaller than the other tooth but distinct. Antenna with F1 (except in *T. austriacus*-group) proximally at least slightly broader than anellus, the latter quadrate or (more often) transverse. Propodeum often weakly sculptured or partly smooth, if not then scutellum with a frenal area. Metacoxa pilose or bare dorsally in basal half. Scutellum with frenal area delimited or not. Hosts, so far as known, otherwise ..... 3
  - 3 Scutellum with a frenal area, either delimited anteriorly by a more or less distinct impressed line, or represented by an area differing in sculpture and nearly devoid of setae ..... 4
    - Scutellum without any indication of a frenal area, with setae distributed over its whole surface except sometimes the extreme posterior margin ..... 10
  - 4 Hind femur with a distinct tooth ventrally in apical part ..... 5
    - Hind femur without or at most with an indication of a tooth ..... 6
  - 5 Propodeum smooth between spiracles except for a row of punctures along the base and 1 to 3 fine longitudinal striolae on each side of the median line .....  
 ..... *T. armatus* (species sola)
  - Propodeum between spiracles areolate-rugose or rugose ..... *T. cupreus*-group  
*T. calcaratus* (Nees), *cupreus* (Spinola). *T. pulcher* Bouček may belong here.
  - 6 OOL 2.0-3.0 times OD, ocelli very small (fig. 31). Scutellum (figs 32, 131) pointed at base; frenal area not delimited anteriorly by an impressed line, differing only in sculpture from rest of scutellum, provided with a few setae. Fore femur very stout, only 2.7-2.8 times as long as broad. Costal cell of forewing narrow, 10-12.5 times as long as broad. Metacoxa pilose dorsally in basal half .... *austriacus*-group  
*T. austriacus* Graham, *imperatrix* spec. nov.
  - OOL 0.5-1.8 OD, ocelli moderate-sized or large. Scutellum narrowly to broadly rounded at base; frenal area devoid of setae and (except in *azureus*) delimited anteriorly by an impressed line. Fore femur 3.1-3.9 times as long as broad. Costal cell of forewing (except in *T. varians*-group) 8-9.5 times as long as broad. Metacoxa (except in *T. affinis*) bare dorsally in basal half ..... 7
  - 7 Metacoxa elongate (fig. 36). Scutellar frenal area not delimited anteriorly by an impressed line, but devoid of setae (fig. 35). Occipital carina weak, especially laterally. Host on Gymnospermae ..... *T. azureus* (species sola)

- Metacoxa normal. Scutellar frenal area delimited by an impressed line. Occipital carina distinct. Hosts on Angiospermae ..... 8
- 8 Stigma petiolate (figs 79, 163). Posterior margin of gastral tergite 4 incised. Species either parasites of Cynipidae on *Quercus*, or phytophagous in seeds of Rosaceae 9
- Stigma sessile or practically so (fig. 38). Posterior margin of gastral tergite 4 entire (fig. 39). Species parasitic on *Tetramesa* species (Chalcidoidea) on Gramineae ..... *T. baudysi*-group  
*T. baudysi* Boucek  
*T. baudysi* is closely related to the Nearctic *T. thalassinus*, with which it can be united in one species group.
- 9 Costal cell of forewing 8-9.5 times as long as broad. Propodeum usually with some stronger sculpture medially. Parasites of Cynipidae on *Quercus* ..... *T. cyaneus*-group  
*T. affinis* (Fonscolombe), *cerri* (Mayr), *cyaneus* (Walker), *fastuosus* Boheman, *gracilior* Graham, *notatus* (Walker).
- Costal cell of forewing 11-12 times as long as broad. Propodeum nearly smooth medially. Species phytophagous (or ectoparasitic on *Megastigmus*) in seeds of Rosaceae ..... *T. varians*-group  
*T. aucupariae* Rodzianko, *druparum* Boheman, *varians* (Walker).
- 10 Mesoscutum and scutellum with relatively large, close piliferous punctures (fig. 106). Hind coxa bare dorsally in basal half. Parasites of Cynipidae causing galls on roots or bole of *Quercus* ..... *T. erucarum*-group  
*T. erucarum* (Schrank), *formosus* (Walker), *nobilis* Boheman, *roboris* (Walker), *scutellaris* (Walker). *T. nemorum* Boucek may belong here.
- Mesoscutum and scutellum most often with smaller or less close piliferous punctures; if not then hind coxa pilose dorsally in basal half. Parasites of Diptera Cecidomyiidae, or of Cynipidae on plants other than *Quercus* ..... 11
- 11 Antenna with F1 slightly to much longer than pedicellus. Hind coxa bare dorsally in basal half. Scape reaching slightly to much above vertex. Parasites of Cecidomyiidae on *Fagus* ..... *T. hederiae*-group  
*T. fagi* Hoffmeyer, *fagineus* Graham, *hederiae* (Walker), *speciosus* Boheman.
- Antenna with F1 usually not longer than pedicellus but if so then hind coxa pilose dorsally in basal half. Scape rarely reaching above vertex. Hosts not on *Fagus*) (- except *T. cultriventris*) ..... 12
- 12 Longer spur of hind tibia more than 0.5 length of basitarsus (fig. 99). Hind coxa bare dorsally in basal half. Parasites of Cynipidae, mostly on *Quercus*, occasionally on *Acer* ..... *T. flavipes*-group  
*T. flavipes* (Walker), *longicalcar* Graham.
- Longer spur of hind tibia 0.3-0.5 length of basitarsus. Hind coxa bare or pilose dorsally in basal half. Either parasites of Diptera Cecidomyiidae, or of Cynipidae on plants other than *Quercus* ..... 13
- 13 Spurs of hind tibia (fig. 178) very short. Hind coxa bare dorsally in basal half. Species associated with *Salix* ..... *T. pulchellus*-group  
*T. lampros* Graham, *microcerus* (Walker), *pulchellus* Thomson.
- Spurs of hind tibia of normal length. Hind coxa most often pilose dorsally in basal half. Species often having different hosts ..... 14

- 14 Forewing (fig. 28) with 2-3 rows of setae on cubital vein (below the basal cell). Basal sternite of gaster very long, reaching far beyond hind coxa. Hosts Cecidomyiidae on *Phragmites* ..... *T. arundinis* (species sola)
- Forewing with one row of setae, or none, on subcubital vein below basal cell. Basal sternite of gaster rarely so long (some *cingulatus* specimens). Hosts, except *poae* and *stenus* not on Gramineae ..... 15
- 15 Forewing (fig. 94): stigma large, surrounded by a brownish cloud; basal cell bare or nearly so. Ovipositor sheaths about as long as body. Host on *Quercus ilex* ..... *T. favardi* (species sola)
- Forewing with stigma nearly always smaller, if doubtful or surrounded by a brownish cloud (*T. flavovariegatus* and *spilopterus*), then basal cell extensively or wholly pilose and/or ovipositor sheaths shorter than body. Hosts not on *Quercus* ..... 16
- 16 Hind coxa long, 2.5-2.9 times as long as broad, bare dorsally in basal half ..... *T. cingulatus*-group  
*T. angelicae* (Walker), *cingulatus* (Nees), *filipendulae* spec. nov., *micrurus* Boucek, *poae* Hoffmeyer, *quercinus* Boheman, *triangularis* Thomson.
- Hind coxa at most 2.35 times as long as broad, pilose dorsally in basal half except in *tipulariarum*, *basalis*, *ramicola*, and some *phillyreae* (all in *bedeguaris*-group) ..... 17
- 17 Forewing: speculum absent. Legs black. Ovipositor sheaths not longer than gaster. Palpi black ..... *T. apiomyiae* (species sola)
- Forewing: speculum present. Legs very rarely black or nearly wholly so (only *nigritarsus*, which has the ovipositor sheaths longer than gaster). Palpi often pale ..... *T. bedeguaris*-group

subgroup *bedeguaris*

*T. auratus* (Müller), *bedeguaris* (L.), *eadyi* spec. nov., *eglanteriae* Mayr, *geranii* (Walker), *rubi* (Schrank), *thymi* Ruschka. *T. boops* Graham and *microstigma* (Walker) may belong here.

subgroup *chloromerus* (Walker)

*T. aceris* Boucek, *anthobiae* Ruschka, *arcadius* spec. nov., *arcella* spec. nov., *argei* Boucek, *artemisiae* Mayr, *borealis* Thomson, *bouceki* spec. nov., *brachyurus* Boheman, *breviscapus* spec. nov., *caledonicus* spec. nov., *canariensis* Hedqvist, *capitonis* spec. nov., *caudatulus* spec. nov., *caudatus* Boheman, *centor* spec. nov., *chlorocopus* Boheman, *chloromerus* (Walker), *confinis* (Walker), *corni* Mayr, *janetiellae* spec. nov., *crassiceps* spec. nov., *cretaceus* spec. nov., *cultratus* spec. nov., *cultriventris* Ratzeburg, *cupratus* Boheman, *curtisi* spec. nov., *curvatulus* spec. nov., *epilobii* spec. nov., *fractiosus* spec. nov., *frater* Thomson, *fuscipes* Boheman, *galeobdolonis* spec. nov., *galii* Boheman, *genisticola* Ruschka, *giraudianus* Hoffmeyer, *gloriosus* spec. nov., *halimi* spec. nov., *helveticus* spec. nov., *heterobiae* spec. nov., *hornigi* Ruschka, *impar* (Rondani), *lapsanae* Hoffmeyer, *laricis* Boucek, *lathyri* spec. nov., *lythri* Boucek, *millefolii* Ruschka, *monticola* spec. nov., *narvikensis* Graham, *orobi* Mayr, *paludum* spec. nov., *partitus* spec. nov., *pascuorum* Boucek, *pastinacae* spec. nov., *persicariae* Mayr, *phillyreae* Ruschka, *problematicus* spec. nov., *purpureae* spec. nov., *putoniellae* spec. nov., *quadriceps* spec. nov., *ramicola* Ruschka, *rhamni* Boucek, *rosariae* spec. nov., *ruschkai* (Hoffmeyer), *scandicus* spec. nov., *schizothecae* Ruschka, *seminum* Hoffmeyer, *socius* Mayr, *spherocephalus* spec. nov., *stenus* Graham, *tanaceticola* Ruschka, *ulmariae* Ruschka, *valerii* spec. nov., *verbasci* Ruschka, *veronicae* Ruschka, *wachtliellae* spec. nov., *T. hylesini* Graham, *pygmaeus* Mayr and *spaici* Boucek may belong here.

subgroup *juniperi*

*T. caudatus* Boheman, *flavovariegatus* Gijswijt, *juniperi* (L.), *nigritarsus* (Walker), *spilopterus* Boheman. *T. heyeri* Wachtl may belong here.

subgroup *tipulariarum*

*T. amurensis* (Walker), *basalis* (Walker), *curticauda* spec. nov., *lampros* Graham, *novitzkyi* Graham, *quercinus* Boheman, *salicis* Graham, *tipulariarum* Zetterstedt. *T. poae* Hoffmeyer may belong here.

Note: most species in the *T. bedeguaris* group have the hind coxae more or less hairy dorsally in basal half; those with bare coxae are: *T. tipulariarum*, *amurensis*, *basalis*, *curticauda*, some *phillyreae*, *ramicola*

### Key to European females of the genus *Torymus*

- 1 Antenna (figs 104, 157) with F1 anelliform, distinctly broader than long, usually lacking sensilla; some of the following segments broader than long. Ovipositor sheaths nearly as long as, or longer than the body. Posterior third of scutellum partly or (fig. 156) mainly smooth, without setae; mesoscutum and scutellum very shiny. Dorsal surface of hind coxa bare in basal half. Hind tibia with one distinct spur. [Very small species: length 1.2-1.8 mm; body bright blue, green, or golden green] ..... 2
- Antenna in most species with F1 not anelliform, as long as or longer than F2 and provided with sensilla; if F1 is somewhat shorter than F2 (*T. eglanteriae*, *ramicola*, *pygmaeus*, *heyeri*, *pulchellus*, *spherocephalus*) then either ovipositor sheaths are much shorter than the body or (*T. eglanteriae*, *ramicola*) F1 is not broader than long and has at least one sensillum, while the whole scutellum is reticulate and has some setae in the posterior third. Dorsal surface of hind coxa bare or pilose in basal half. Hind tibia with two distinct spurs; if the outer spur is distinctly shorter than the inner one, then posterior part of scutellum is reticulate and provided with setae 3
- 2 Fore coxae at least yellow apically, sometimes about half yellow. Scape yellow beneath, or almost wholly so. Ovipositor sheaths as long as or very slightly longer than metasoma plus mesosoma. Antennal flagellum pale brown or testaceous beneath ..... *T. nitidulus* (Walker)
- Fore coxae black. Scape often wholly dark, sometimes pale over basal 0.3-0.65 beneath. Ovipositor sheaths slightly shorter than metasoma plus mesosoma, rarely as long. Antennal flagellum fuscous to black ..... *T. fuscicornis* (Walker)
- 3 Antenna (figs 86, 157) with F1 slightly to quite distinctly shorter than F2, seen in profile with only one sensillum or two sensilla. Ovipositor sheaths somewhat longer than the body, index 3.5-4.5. Dorsal surface of hind coxa bare in basal half. [Body rather dark blue-green to blue, gaster sometimes more or less violet] ..... 4
- Antenna normally with F1 as long as or longer than F2 and provided with sensilla (usually more than 2 visible in profile); if F1 is somewhat shorter than F2 (*T. pygmaeus*, *pulchellus*, *spherocephalus*, some *heyeri*) then the ovipositor sheaths are much shorter than the body. Dorsal surface of hind coxa often pilose in basal half ..... 5
- 4 Antenna (fig. 187) with anellus broader than long; scape nearly 4 times as long as broad; F2 distinctly longer than broad. Antennal scape testaceous except dorsally. Head (fig. 186) with temples converging strongly ..... *T. ramicola* Ruschka

- Antenna (fig. 86) with anellus quadrate or nearly so; scape about 3 times as long as broad; F2 quadrate. Antennal scape black with at most the basal half pale beneath. Head (fig. 85) with temples more rounded ..... *T. eglanteriae* Mayr
- 5 Posterior 0.25 to 0.45 of scutellum ("frenal area") differentiated in some way from the rest: either extensively or wholly polished and smooth, or delimited anteriorly by a weak to strong impressed line; the differentiated area is also devoid of piliferous punctures, except in *imperatrix*, which has several (fig. 131) ..... 6
- Scutellum without any such differentiated area posteriorly, wholly reticulate (though occasionally the sculpture becomes gradually weaker towards the posterior edge of the scutellum) and with some piliferous punctures in the posterior part ..... 25
- 6 Sides of hind coxa with a smooth area in upper half and without a dorsal carina. Forewing with a distinct brown cloud, gaster broadly reddish at base ..... *T. pulcher* Boucek
- Sides of hind coxa reticulate all over; if more or less smooth in upper part (*T. calcaratus*) then with a distinct dorsal carina. Forewing without distinct cloud ..... 7
- 7 Hind femur with a tooth ventrally (one doubtful species is included in both sections) ..... 8
- Hind femur without tooth ..... 11
- 8 Hind coxa dorsally thickly pilose ..... *T. cupreus* (Spinola)
- Hind coxa dorsally bare ..... 9
- 9 Ovipositor index 1.5-1.55 ..... *T. fastuosus* Boheman
- Ovipositor index larger than 2.5 ..... 10
- 10 Propodeum between spiracles smooth except for a row of punctures along the base and 1 to 3 fine longitudinal striolae on each side of the median line. Forewing: PM 3.3-3.8 times length of ST. Scutellar frenum occupying 0.4-0.45 length of scutellum. Malar space 0.2-0.3 length of eye. External surface of hind coxa wholly reticulate. Colour of head, mesosoma, hind legs except tibiae and tarsi and metasoma bright green ..... *T. armatus* Boheman
- Propodeum between spiracles areolate-rugose. Fore wing: PM at most twice length of ST. Scutellar frenum 0.25-0.3 length of scutellum. Malar space 0.3-0.35 length of eye. External surface of hind coxa extensively smooth. Head, mesosoma hind legs except tarsi blue to violet, rarely greenish in parts, gaster fiery red. .... *T. calcaratus* Nees
- 11 Dorsal surface of hind coxa pilose in the basal half. Ovipositor sheaths about as long as or slightly shorter than the gaster, index 1.45-1.7. Mesoscutum and scutellum with few, widely-spaced, piliferous punctures. Forewing with upper surface of costal cell bare. OOL 2.0-2.3 times OD. Mesepimeron large (much as in *T. formosus*, fig. 101), square ..... 12
- Dorsal surface of hind coxa bare except in *T. affinis*, which has ovipositor sheaths longer than the body. Mesoscutum and scutellum with numerous and closer piliferous punctures. Upper surface of costal cell with some setae. OOL at most 1.8 times OD. Mesepimeron small and at least slightly higher than broad ..... 13
- 12 Frenum of scutellum (fig. 32) without punctures. POL 1.0-1.3 times OOL. Antenna (fig. 33) with F1 a little constricted basally ..... *T. austriacus* Graham

- Frenum of scutellum (fig. 131) with 4-9 piliferous punctures. POL 1.3-1.6 times OOL. Antenna (fig. 129) with F1 not constricted basally ..... see *T. imperatrix* spec. nov. (couplet 101)
- 13 Vertex with a fine suture connecting each lateral ocellus with the adjacent eye (fig. 13). Dorsal surface of hind coxa with at least a few setae in basal half, and without a dorsal carina. Ovipositor index 4.5-7.0. Mesoscutum and scutellum with numerous piliferous punctures. [Host on *Quercus* ] ..... *T. affinis* (Fonsc.)
- Vertex without a suture between lateral ocelli and eyes. Dorsal surface of hind coxae bare in basal half, often with a longitudinal curved carina. Ovipositor index at most 4.3 except in *T. azureus*, which has very sparse piliferous punctures on mesoscutum and scutellum. .... 14
- 14 Hind coxa (fig. 36) nearly 4 times as long as broad, its posterior edge nearly straight. Legs very slender; hind femur about 5 times as long as broad. Scutellum with frenal area not marked off by an impressed line. Piliferous punctures of mesoscutum and scutellum small, on scutellum sparse. Ovipositor sheaths 1.25-1.8 times length of body. Hosts on conifers ..... *T. azureus* Boheman
- Hind coxa stouter, its posterior edge distinctly curved. Ovipositor sheaths not longer than the body, or if so then the hind femur is not 4 times as long as broad and the scutellum has the frenal area marked off by at least a weak transverse impressed line. Hosts not on conifers ..... 15
- 15 Posterior ocelli (fig. 78) large, OD greater than OOL. Posterior 0.25-0.3 of mesoscutum, axillae partly, and scutellum anterior to frenal area (fig. -) smooth and polished between the very distinct piliferous punctures. Eyes separated by somewhat less than their length (fig. 77) ..... 16
- Posterior ocelli (figs 83, 90, 113, 230) smaller, OD equal to or smaller than OOL. Mesoscutum, axillae, and scutellum anterior to frenal area (fig. 162) alutaceous or reticulate between the piliferous punctures. Eyes separated by their own length or somewhat more ..... 18
- 16 Ovipositor sheaths 1.1-1.2 length of body, index about 3.5. Body-length 4-5 mm .... ?*T. macrurus* (Foerster) see under species inquirendae
- Ovipositor sheaths slightly to much shorter than the body, index 1.7-2.6. Body-length 2.1-4.0 mm ..... 17
- 17 Ovipositor index 1.7-2.1. Head and thorax green to blue; gaster sometimes with slight violet tinge in places ..... *T. cyaneus* (Walker)
- Ovipositor index 2.25-2.6. Head and thorax often partly or extensively violet, gaster partly to wholly so ..... *T. cyaneus* forma *lazulinus* (Foerster)
- 18 Ovipositor sheaths somewhat longer than the body; index 3.9-4.3. Gaster (fig. 232) compressed, dorsally carinate; basal sternite (fig. 231) extremely long, about twice length of hind coxa and reaching nearly to tip of hypopygium; hind margin of tergite 4 deeply triangularly emarginate. Propodeum very weakly alutaceous-reticulate, without striae. [hind coxa without a dorsal carina except at extreme base] [Phytophagous species on Rosaceae] ..... 19
- Ovipositor sheaths shorter than the body; index 1.5-2.8. Gaster (except in *T. gracilior* ) not or hardly compressed; basal sternite less than twice length of hind coxa and not reaching tip of hypopygium; hind margin of tergite 4 (fig. 165) not or hardly emarginate. Propodeum often with some longitudinal striae, at least on



- either side of the median line ..... 20
- 19 Antenna with anellus quadrate. Head in dorsal view (fig. 230) 1.7-1.75 times as broad as long. Species associated with *Crataegus* ..... *T. varians* (Walker)
- Antenna with anellus 1.15-1.3 times as broad as long. Head in dorsal view (fig. 83) 1.8-1.9 times as broad as long. Species associated with *Sorbus* and *Malus* ..... *T. druparum* Boheman
- 20 Ovipositor index 2.3-2.8. Gaster compressed; hind margin of tergite 4 triangularly emarginate. Hind coxa without a distinct dorsal carina. Antennal flagellum (fig. 115) rather slender. Propodeum medially slightly shorter than scutellar frenum, nearly smooth medially, otherwise weakly alutaceous ..... *T. gracilior* Graham
- Ovipositor index 1.5-2.25. Gaster not or only slightly compressed; hind margin of tergite 4 not or only very shallowly emarginate (fig. 165). Hind coxa (except in *T. fastuosus* which has antennal flagellum very stout, (fig. 92)) with a dorsal carina. Propodeum medially as long as or somewhat longer than scutellar frenum, often with some sculpture in median third ..... 21
- 21 Propodeum (fig. 164) with at least a weak longitudinal stria, often 2-3 longitudinal striae, on each side of median line. Forewing (fig. 163) with M 6-8.5 times length of ST; stigma distinctly petiolate; speculum not reaching ST. Species associated with *Quercus* ..... 22
- Propodeum with median third very weakly alutaceous or smooth, without trace of striae. Forewing with M 8-16 times length of ST; stigma (fig. 38) shortly petiolate or subsessile; speculum sometimes extending to ST. Species not associated with *Quercus* ..... 24
- 22 Hind coxa without a dorsal carina. Antenna (fig. 92) with flagellum stout, tending to be cylindrical; sensilla rather short, in 2 (occasionally 3) rows on each funicular segment; scape extensively to wholly testaceous. Ovipositor index 1.5-1.55 ..... *T. fastuosus* Boheman
- Hind coxa with a distinct dorsal carina. Antenna (fig. 161) with flagellum tending to be slightly clavate, especially in smaller females; sensilla longer, in 1 row, or 2 overlapping rows, on each funicular segment; scape black or partly testaceous. Ovipositor index 1.5-2.25 ..... 23
- 23 Ovipositor index 2.0-2.25, sheaths distinctly longer than gaster. Forewing stigma often enclosed in a small fuscous cloud (fig. 163) ..... *T. notatus* (Walker)
- Ovipositor index 1.5-1.75, sheaths not or hardly longer than gaster. Forewing without any dark surround ..... *T. cerri* Mayr
- 24 Ovipositor index 1.95-2.25. Scutellar frenum wholly or almost wholly smooth. Forewing with M 8.0-9.5 times length of ST; stigma shortly petiolate; speculum not reaching ST. Hind coxa with dorsal carina absent except at extreme base. Usually only hind femora infusate, sometimes the other femora partly so; tibiae testaceous. Phytophagous in seeds of *Sorbus* ..... *T. aucupariae* Rodzianko
- Ovipositor index 1.5-1.7. Scutellar frenum wholly alutaceous (occasionally the sculpture is weak medially). Forewing (fig. 38) with M 12-15 times length of ST; stigma subsessile; speculum reaching ST. Hind coxa with a fine dorsal carina, traceable for more than half its length. All femora and tibiae mainly black. Parasite of *Tetramesa* spp. in culms of Gramineae ..... *T. baudysi* Boucek
- 25 Propodeum (fig. 125) sloping at only about 30 degrees relative to longitudinal axis

- of body, relatively dull, with distinct, more or less raised reticulation, often also with some irregular wrinkles or rugosity. Mesoscutum and scutellum shiny, with large though widely spaced piliferous punctures. Hind coxa with dorsal surface pilose in basal half. Antenna (fig. 127): F4-F7 each with a stripe of micropilosity beneath. Ovipositor sheaths about as long as body. [Thorax green to blue; vertex often coppery or crimson. Legs, except mid and hind coxae, red] .....  
 ..... *T. igniceps* Mayr
- Propodeum (except in *T. scaposus* and some *laetus*) sloping more steeply, in most species shiny with some superficial or engraved sculpture. Mesoscutum and scutellum usually less shiny, if with large punctures then these are closer together. A very few species in which the propodeal sculpture sometimes approaches that of *T. igniceps* have the hind coxa bare dorsally and the ovipositor sheaths much shorter than the body. Antennal flagellum without areas of micropilosity beneath except in *T. chrysocephalus* and *fischeri*, which also have bare hind coxa and ovipositor sheaths shorter than the body ..... 26
- 26 Forewing (fig. 94) with stigma large, with a brownish curved cloud extending below it; speculum large, extending as far as ST; PM only 1.2-1.5 times length of ST. Ovipositor sheaths as long as or a little longer than body. POL 1.1-1.27 times OOL. Mesoscutum and scutellum rather dull, with extremely fine and dense reticulation; piliferous punctures minute and hardly visible, very sparse on scutellum ..... *T. favardi* Steffan
- Forewing with stigma smaller, without a defined dark cloud extending below it except in *T. spiloferus* and *flavovariegatus*, which have ovipositor sheaths much shorter than body and POL 1.9-2.0 times OOL. (There may be a diffuse dark streak or cloud on the disc of the wing, not touching the stigma, in some *T. regalis* and *laetus*, which have ovipositor sheaths much shorter than body; and some *erucarum* in which speculum does not reach ST and POL is at least 1.5 times OOL). Mesoscutum and scutellum usually with larger or more distinct punctures ..... 27
- 27 Forewing with a fuscous cloud extending from the stigma to nearly half way across the wing. Pronotum, mesoscutum, and scutellum with very fine and dense reticulation (especially in *T. flavovariegatus*), amongst which the piliferous punctures are inconspicuous. Gaster bronze to purplish with basal part blue to blue-green ..... 28
- Forewing without a fuscous cloud extending from the stigma, though occasionally somewhat infumate discally, or with a diffuse cloud which does not touch the stigma. Pronotum, mesoscutum and scutellum nearly always with less dense reticulation, most often with distinct piliferous punctures. Gaster nearly always differently coloured ..... 29
- 28 Ovipositor index 2.0-2.2, sheaths slightly longer than the gaster. Head in front view (fig. 218) virtually circular. Forewing: basal cell with at most a row of setae below SM. Body rather slender, without testaceous areas ..... *T. spiloferus* Boheman
- Ovipositor index 1.0-1.1, sheaths somewhat shorter than the gaster. Head in front view about 1.2 times as broad as high, nearly trapeziform. Forewing: basal cell wholly pilose. Body rather squat; thoracic pleuron and gaster ventrally testaceous except in very dark specimens ..... *T. flavovariegatus* Gijswijt
- 29 Forewing (fig. 28): lower surface with a double or triple row of setae below the

- cubital vein. Ovipositor sheaths somewhat longer than body. [Spurs of hind tibia relatively short, length of the longer spur hardly one-third that of basitarsus. Dorsal surface of hind coxa with 2-8 setae in basal part, rarely bare. POL 1.5-1.6 times OOL] ..... *T. arundinis* (Walker)
- Forewing (figs 30, 94): lower surface normally with one row of setae, or none, below the cubital vein (*T. arcticus* and *helveticus* may have 2 rows but they have ovipositor sheaths not longer than gaster) ..... 30
- 30 Species with the following combination of characters: antenna (fig. 182) with flagellum proximally distinctly more slender than the pedicellus, but thickening distad so as to be fairly strongly clavate; F1 lacking sensilla, a little shorter than F2. Hind coxa nearly bare dorsally (only 2-3 setae in basal half in the specimens seen); ovipositor sheaths about as long as gaster. Very small species: length 1.2-1.5 mm, body blue-green to greenish-blue; antennal scape black, or paler below, the radicle always pale; legs with femora mainly black, tibiae sometimes more or less infuscate; parasite of *Contarinia subulifex* in galls on *Quercus cerris* ..... *T. pygmaeus* Mayr
- Not having the above combination of characters ..... 31
- 31 Shorter spur of hind tibia in most species more than half as long as the longer spur; if only half (*T. longicalcar*, *flavipes*) then length of longer spur is much greater than the breadth of the tibia. Gaster nearly always with tip of hypopygium situated more distad. Hind coxa either bare, or more or less pilose, dorsally in basal half ..... 32
- Shorter spur of hind tibia only half as long as the longer spur, length of the latter only equal to maximum breadth of the tibia. Gaster tending to appear triangular in profile, the tip of the hypopygium situated only slightly beyond the apex of the basal sternite. Hind coxa normally bare dorsally in basal half, rarely with 1-2 setae in *T. microcerus*. (Species associated with *Salix* ) ..... 70
- 32 Longer spur of hind tibia (figs 99, 143) 0.6-0.65 length of basitarsus and 1.65-2.0 times the breadth of the tibia. Hind coxa bare dorsally in basal half; basitarsus of hind legs nearly or quite half as long as tibia ..... 33
- Longer spur of hind tibia (figs 14, 57) 0.3-0.5 length of basitarsus and usually less than 1.65 times the breadth of the tibia but if as much as 1.65 then hind coxa pilose dorsally in basal half. Basitarsus of hind legs usually relatively shorter ..... 34
- 33 Gaster (fig. 146) with tip of hypopygium very near or level with apex of gaster; ovipositor sheaths usually a little longer than the body, o.i. 3.3-3.5. Thorax (fig. 144) slender, 1.9-2.2 times as long as broad. Legs very slender: hind coxa more than 2.5 times as long as broad. Gaster reddish-yellow ventrally in at least basal half, sometimes whole gaster except the dorsal surface pale ..... *T. longicalcar* Graham
- Gaster with tip of hypopygium situated at about 0.75 its length; ovipositor sheaths (often much) shorter than body, o.i. at most 3.0. Thorax more squat, 1.75-1.8 times as long as broad. Legs stouter; hind coxa about twice as long as broad. Gaster normally without pale area, rarely obscurely reddish at extreme base ..... *T. flavipes* (Walker)
- 34 Hind coxa dorsally bare in basal half (as in fig. 101) ..... 35
- Hind coxa sparsely to thickly pilose dorsally in basal half (fig. 50) (a few border-

- line cases are included in both sections of the key) ..... 72
- 35 Ovipositor sheaths fully as long as, or a little longer than, the body; index 3.5-4.8. Mesoscutum and scutellum (especially the latter) with sparse piliferous punctures. Antennal scape, except in *T. cyprianus* spec. nov., only 0.7 length of eye and reaching only to lower edge of anterior ocellus. Head and thorax blue-green to blue, or with violet parts; gaster blue-green, blue, or mainly violet ..... 36
- Ovipositor sheaths at most as long as metasoma plus mesosoma, except in *T. erucarum*, which has numerous and moderately close piliferous punctures on mesoscutum and scutellum, antennal scape reaching level of vertex and 0.9 length of eye, head and thorax partly purplish or coppery, gaster with a reddish subbasal ring or band; and in *T. fagi*, in which scape reaches level of vertex or slightly above it ..... 38
- 36 Antenna: scape longer than transverse diameter of eye; pedicellus plus flagellum 1.45 times breadth of head; F1 slightly longer than the pedicellus. Legs, except coxae, testaceous ..... *T. cyprianus* spec. nov.
- Antenna: scape shorter than transverse diameter of eye; pedicellus plus flagellum 1.25-1.35 times breadth of head; anellus distinctly transverse; F1 slightly shorter than, or as long as pedicellus. Legs with femora black; hind tibiae sometimes more or less infusate medially ..... 37
- 37 Host on *Populus*. Malar space 0.42-0.47 length of eye. [Forewing (fig. 185)] ..... *T. quercinus* Boheman
- Host on *Poa*. Malar space about 0.35 length of eye ..... *T. poae* (Hoffmeyer)
- 38 Antennal flagellum (figs 88, 117, 214) slender, proximally not or hardly stouter than the pedicellus; F1 1.6-2.9 times as long as broad, slightly to much longer than the pedicellus; the following segments, or at least F2 and F3, longer than broad; scape reaching slightly to well above level of vertex. POL 2.0-2.7 times OOL. Temples converging very strongly and straight or weakly curved, 0.05-0.25 length of eyes (figs 89, 116, 213). [Ovipositor sheaths longer than gaster but usually shorter than body]. Genae, behind malar sulcus, with delicate alutaceous sculpture which extends nearly to quite to the sulcus. Species associated with *Fagus* ..... 39
- Antennal flagellum usually with F1 stouter than pedicellus and at most 1.5 times as long as broad, if longer (some *T. scaposus*, *laetus*, *regalis*) then it is not longer than the pedicellus, the scape does not reach above the vertex, and POL is only 1.6-1.75 times OOL. Temples usually converging less strongly and more distinctly curved. Genae, just behind the malar sulcus, usually with a narrow to broad smooth strip ..... 42
- 39 Gaster reddish or yellowish at least at base ventrally, sometimes wholly so except the dorsal surface. Temples (fig. 89) only 0.05-0.13 length of eyes. POL 2.3-2.7 times OOL. Mesepimeron moderate-sized, 1.0-1.2 times as high as broad. Hind coxa about twice as long as broad. [Antenna, fig. 88; ovipositor index 2.0-2.65, sheaths as long as metasoma plus half to three-quarters length of mesosoma] ..... *T. fagineus* Graham
- Gaster not pale marked. Temples (figs 116, 213) 0.16-0.25 length of eyes. POL 2.0-2.35 times OOL. Mesepimeron smaller, 1.5-1.7 times as high as broad. Hind coxa 2.5-3.0 times as long as broad ..... 40
- 40 Ovipositor index 2.1-2.3, sheaths about as long as gaster plus half thorax. Antenna

- (fig. 117) with F1 1.65-1.85 times as long as broad; F5 sometimes quadrate, F6 and F7 quadrate, or F7 slightly transverse. Coxae usually darker, hind coxae usually wholly dark, mid and fore coxae usually dark basally. Parasite of *Hartigiola annulipes* ..... *T. hederæ* (Walker)
- Ovipositor index 2.5-2.8, sheaths at least as long as body minus head. Antenna (fig. 214) with F1 1.8-2.9 times as long as broad, the following segments longer than broad except sometimes F7. Legs including coxae either wholly testaceous, or at most hind coxae wholly dark. Parasites of *Mikiola fagi* ..... 41
- 41 Hypopygium bare except for some setae at its tip. Ovipositor sheaths about as long as body minus head ..... *T. speciosus* Boheman
- Hypopygium pilose along its whole length. Ovipositor sheaths about as long as body ..... *T. fagi* (Hoffmeyer)
- 42 Antennal clava ventrally (fig. 61) with a long strip of micropilosity which extends over C2 and C3; flagellum distinctly clavate. Eyes (fig. 60) with short but distinct pilosity. POL 1.2-1.4 times OOL. OOL 1.5-2.0 times OD. Piliferous punctures of mesoscutum and scutellum small or minute and sparse. [Ovipositor sheaths about as long as gaster which is usually more or less yellow basally] ..... *T. chrysocephalus* Boheman
- Antennal clava ventrally with a small area of micropilosity on C3 only; flagellum clavate to almost cylindrical. Eyes with very short to extremely short pilosity (not clearly visible X 50). Ratio POL:OOL often greater; ratio OOL:OD often less. Piliferous punctures of mesoscutum and scutellum sometimes larger and/or more numerous ..... 43
- 43 Antenna (fig. 135) with F1 gradually narrowing to base, where it is not broader than the anellus, to which it is closely applied, 1.5-2.0 times as long as broad. Propodeum tending to be more strongly sculptured than usual, most often (fig. 138) with some striae, wrinkles or rugosity. POL 1.6-1.75 times OOL. OOL 1.25-1.6 times OD. [Anellus quadrate, or even slightly longer than broad. Gaster not pale-marked; ovipositor sheaths much shorter than body] ..... 44
- Antenna: (figs 170, 190) with F1 most often distinctly broader at base than the anellus, from which it is separated by a distinct constriction; anellus sometimes broader than long. Propodeum with fine, superficial or engraved sculpture, sometimes partly smooth. Ratio POL:OOL sometimes greater; ratio OOL:OD sometimes less than in above ..... 46
- 44 Antennal scape (fig. 204) slightly curved, broadening gradually in upper half, 0.85-0.9 length of an eye. Forewing hyaline ..... *T. scaposus* Thomson
- Antennal scape (fig. 136) straight, not or only very slightly broader in upper half, 0.7-0.8 length of eye. Forewing often with a more or less developed brownish cloud on the disc (especially in *T. regalis*) ..... 45
- 45 Width of frons 1.12-1.13 length of an eye. Head and mesosoma mainly violet or violet-blue; gaster coppery or fiery with base green to blue. OOL 1.5-1.85 times OD. Rare species..... *T. regalis* (Walker)
- Width of frons 0.96-1.03 length of an eye. Head and mesosoma golden-green, green, blue or with brassy to coppery areas; gaster usually more or less purplish or coppery-purple (less often coppery) with base green to blue. OOL 1.25-1.5 times OD. Common and widespread species ..... *T. laetus* (Walker)

- 46 Antennal scape reaching above level of vertex. Ovipositor sheaths shorter than body but longer than gaster. Gaster with at least a reddish subbasal ring, often more extensively reddish ventrally. Head and mesosoma mainly to wholly dark blue, or violet. [Species associated with *Quercus* ] ..... 47
- Either antennal scape does not reach above level of vertex, or ovipositor sheaths are at least slightly longer than body; or the gaster not pale-marked. Head and mesosoma usually with different colouration from above ..... 48
- 47 Length of antennal scape 0.8-0.85 length of eye. Malar space 0.31-0.37 length of eye. POL 1.8-2.1 times OOL. Ovipositor index 1.8-2.4 ..... *T. nobilis* Boheman
- Antenna with length of scape 1.05-1.1 length of eye. Malar space 0.48-0.53 length of eye. POL 1.55-1.8 times OOL. Ovipositor index 2.4-2.7 ..... *T. roboris* (Walker)
- 48 Ovipositor sheaths longer than body, index 3.8-4.1. Antennal scape reaching level of vertex or slightly above it. Head and dorsum of thorax partly to mainly purplish. Forewing often with a dark discal cloud or streak .....  
..... *T. erucarum* (Schrank)
- Ovipositor sheaths at most as long as body, but usually shorter. Antennal scape usually not reaching level of vertex. Colouration of head and thorax often different from above. Forewing usually hyaline, occasionally more or less infumate discally ..... 49
- 49 Mesepimeron (fig. 101) large and almost circular, its height fully equal to or even a little greater than the length of mid coxa, violet or purplish. Antennal scape reaching level of vertex or even slightly above it. Gaster extensively purplish. [O.i 1.8-2.0] ..... *T. formosus* (Walker)
- Mesepimeron moderate-sized or small, usually at least slightly higher than broad, its height at least a little less than length of mid coxa, often differently coloured from the above. Antennal scape sometimes not reaching level of vertex. Gaster sometimes with different colouration. Ovipositor sheaths sometimes longer, or shorter, than in *T. formosus* ..... 50
- 50 Propodeum with distinct, slightly raised reticulation and with a few longitudinal striae or wrinkles medially. Mesoscutum and scutellum with moderate sized, deep piliferous punctures most of which are separated by less than twice their diameter. Gaster broadly reddish over basal half. Ovipositor sheaths shorter than gaster, index 0.75-0.8 ..... *T. nemorum* Boucek
- Propodeum with very weak alutaceous sculpture, sometimes nearly smooth medially, if with some rather stronger sculpture (some *ventralis*) then mesoscutum and scutellum with very small, more remote punctures and ovipositor sheaths as long as gaster. Gaster (except in *T. ventralis*, *filipendulae*, *cingulatus* and *angelicae*) without reddish colouration; the two latter have ovipositor sheaths longer than gaster, while *ventralis* and *filipendulae* have sheaths as long as gaster ..... 51
- 51 Ovipositor sheaths nearly or about as long as body less head; index 2.7-3.0. Antennal scape very short, length 0.55-0.66 that of eye, reaching only level of lower edge of anterior ocellus. Gaster mainly bronze-purple, not distinctly pale at base ..... *T. scutellaris* (Walker)
- [Note. Some dwarfs of *geranii*, having hind coxae virtually or quite bare dorsally in basal half, may run here; but they have the posterior half of the gaster bluish-green]

- If ovipositor sheaths are as long as above (*T. cingulatus*) then antennal scape reaches above lower edge of anterior ocellus and gaster is extensively reddish-yellow at base and ventrally ..... 52
- 52 Ovipositor sheaths about as long as body less head, with index 2.85-3.2. Gaster with reddish to yellowish subbasal ring, usually also more or less extensively yellowish ventrally. Legs, except hind coxae more or less, reddish-yellow. Hind coxa about 2.5 times as long as broad, their posterior edge distinctly curved. Spurs of hind tibia nearly equal in length. (Antenna, fig. 62) ..... *T. cingulatus* Nees
- Ovipositor sheaths at most as long as metasoma plus half of mesosoma, index at most 2.6. Gaster not distinctly pale at base except in *T. angelicae* and some *filipendulae*; the former has spurs of hind tibia unequal, the latter has hind coxa about 3 times as long as broad, with posterior edge less curved. Legs often darker. Spurs of hind tibia clearly unequal in length ..... 53
- 53 Ovipositor sheaths about as long as metasoma plus half mesosoma, with index 2.15-2.5. Gaster with reddish or yellowish subbasal ring, usually also more or less of the same colour ventrally. Antennal scape reaching level of middle of anterior ocellus, or even slightly above this. [Legs, except hind coxae more or less, yellowish] ..... *T. angelicae* (Walker)
- If ovipositor sheaths are as long as metasoma plus half mesosoma, then either (*T. salicis*) gaster is not pale marked, or (*T. filipendulae*) ovipositor index is at most 2.0 and the antennal scape hardly reaches lower edge of anterior ocellus ..... 54
- 54 Hind coxa about 3 times as long as broad, its posterior edge hardly curved except just at base. Ovipositor index 1.85-2.0. Head in dorsal view (fig. 95) only 1.75-1.9 times as broad as long; vertex purplish or purplish-bronze. Gaster often reddish at base ventrally. (Antenna fig. 96) ..... *T. filipendulae* spec. nov.
- Hind coxa in most species at most 2.5 times as long as broad and with their their posterior edge distinctly curved; if approaching the conditions seen in *filipendulae* then (*T. salicis*, *novitzkyi*) ovipositor index at least 2.3 ..... 55
- 55 Ovipositor index about 0.6 ..... *T. micrurus* Boucek
- Ovipositor index at least 0.85 ..... 56
- 56 Tip of hypopygium (fig. 226) nearly level with apex of gaster. [Base of scutellum broad, nearly truncate] ..... *T. triangularis* Thomson
- Tip of hypopygium at most at 0.8 length of gaster ..... 57
- 57 Gaster with a reddish or reddish-yellow transverse band near the base, often also more or less of the same colour ventrally. Legs, except bases of hind and mid coxae (occasionally also bases of fore coxae) reddish-testaceous. OOL 1.3-1.6 times OD. Forewing sometimes with a brownish streak ..... *T. ventralis* (Fonscolombe)
- Gaster without any pale colour. At least hind coxae mainly to wholly black with metallic tint. OOL 1.0-1.25 times OD. Forewing hyaline ..... 58
- 58 Antenna (fig. 98): F6 and F7 (sometimes also F5) each with a small area of micropilosity beneath. [Forewing: upper surface of costal cell bare except at apex, lower surface broadly bare in the middle. Ovipositor index 1.7-2.0] .. *T. fischeri* Ruschka
- Antenna: funicular segments without areas of micropilosity beneath ..... 59
- 59 Species with the following combination of characters: malar space 0.25-0.26 length of eye. Mesoscutum and scutellum with very numerous and moderate-sized piliferous punctures, many of which are separated by only slightly more than their

- diameter; ovipositor sheaths somewhat longer than gaster, index 1.8-2.0 [head in dorsal view (fig. 43) 2.15-2.2 times as broad as long, with temples only 0.17-0.2 length of eyes and converging very strongly, nearly straight]. Host: *Wachtliella ros-arum* ..... *T. boops* Graham
- Malar space 0.3-0.46 length of eye. Either mesoscutum and scutellum have less numerous, smaller, or widely-separated piliferous punctures; or ovipositor index is different (either greater than 2.0, or at most 1.6) ..... 60
- 60 Setae of mesoscutum, and those of scutellum mainly, very short, decumbent, dense (fig. 173), only a few in posterior quarter of scutellum are longer and somewhat raised. Notauli shallow. Face below toruli thickly clothed with silvery-white downward-pointing setae; sides of face above toruli with similar setae which tend to point obliquely outwards. Malar space 0.4-0.46 length of eye. [Mouth only 1.55-1.75 malar space] ..... 61
- Setae of mesoscutum at least slightly raised, usually longer; setae of scutellum more or less raised, very long in posterior part. Notauli usually deeper but if approaching the condition seen in *T. phillyreae* then malar space shorter. Setae of face usually sparser ..... 62
- 61 Ovipositor index 1.85-2.15, sheaths 1.15-1.4 length of gaster. Hind coxa bare dorsally in basal half. Hind femur green or at least with a metallic shine. Hairrow on underside costal cell at least slightly interrupted. Hosts on *Artemisia* in Spain ..... *T. canariensis* Hedqvist
- Ovipositor index 1.5-1.8, sheaths 1.0-1.15 length of gaster. Hind coxa with some setae dorsally in basal half. Hind femur not metallic. Hairrow on underside costal cell complete. Hosts on different plants, as far as known not on *Artemisia* in Europe (including Spain) ..... *T. phillyreae* Ruschka
- 62 Ovipositor index 1.95-2.7 ..... 63
- Ovipositor index 0.9-1.8 ..... 66
- 63 Head in dorsal view (fig. 199) only 1.8-1.9 times as broad as long, with temples rounded and 0.3-0.35 length of eyes. Ovipositor index 2.30-2.7 ..... 64
- Head in dorsal view 2.05-2.15 times as broad as long, with temples converging strongly and 0.15-0.25 length of eyes. Ovipositor index 1.95-2.25 ..... 65
- 64 Ovipositor index 2.45-2.7. POL 1.7-2.0 times OOL. All femora testaceous ..... *T. salicis* Graham
- Ovipositor index. 2.3-2.35. POL 1.4-1.7 times OOL. Hind femora mainly dark, fore and mid femora more or less infuscate ..... *T. novitzkyi* Graham
- 65 Hypopygium pubescent along its whole length. POL 1.6-1.8 times OOL. Mouth 2.2-2.25 malar space. Anellus broader than long ..... *T. tipulariarum* (Zetterstedt)
- Hypopygium bare except for a few setae at apex. POL 2.0-2.3 times OOL. Mouth 1.7-1.95 malar space. Anellus quadrate ..... *T. grahami* Boucek
- 66 Antenna (fig. 37) with pedicellus distinctly longer than F1, funicle proximally stouter than pedicellus (less obvious in dwarfs). Forewing with PM 1.7-1.9 times length of ST (fig. 38). Host: *Rhopalomyia millefolii* ..... *T. basalis* (Walker)
- Either antenna has pedicellus hardly longer than F1, or the funicle proximally is not stouter than the pedicellus. Forewing with PM 2.0-2.5 times length of ST. Hosts (where known) otherwise ..... 67
- 67 Antenna with funicle virtually cylindrical, proximally somewhat stouter than pedi-



- cellus, which is hardly longer than F1. Hypopygium with some setae on proximal half. [Ovipositor about as long as gaster, index 1.5]. Hosts: *Rabdophaga saliciperda* and *R. rosaria*. Maybe a form of *T. tipulariarum* Zetterstedt, couplet ..... 65
- Antenna (figs 15, 75) with funicle clavate, proximally hardly or only just as stout as pedicellus, the latter distinctly longer than F1. Hypopygium bare except for a few setae at tip or hairy along its whole length ..... 68
- 68 Ovipositor sheaths only half to two-thirds length of gaster, index 0.85-1.0. OOL 1.6-1.8 times OD. Femora all more or less extensively darkened; all coxae dark. Host unknown ..... *T. curticauda* spec. nov. [note: *T. micrurus* Boucek might run here, but its ovipositor is about one-third length of gaster, index 0.55-0.6]
- Ovipositor sheaths not or only slightly shorter than gaster, index 1.1-1.6 (if only 1.1-1.3, then legs paler than in *T. curticauda*). OOL 1.20-1.5 times OD Host on *Salix* ..... 69
- 69 Ovipositor sheaths slightly shorter than gaster, index 1.1-1.3. Hypopygium bare except for a few setae at tip. Hosts *Pontania ?leucaspis* and *Euura atra* on *Salix cinerea* ..... *T. amurensis* (Walker)
- Ovipositor sheaths fully as long as gaster, index 1.4-1.6. Hypopygium setose along its whole length. Swept from foliage of *Salix purpurea* ..... spec. indet.
- 70 Malar space 0.4-0.43 length of eye. Mesoscutum and scutellum not shiny, both with numerous piliferous punctures. Facial pilosity composed of thin setae, which do not hide the surface. [Ovipositor sheaths somewhat shorter than gaster, index 1.2-1.4] Hosts *Euura amerinae* and *Rabdophaga saliciperda* on *Salix*] ..... *T. microcerus* (Walker)
- Malar space 0.3-0.36 length of eye. Mesoscutum and scutellum shiny; scutellum, except at the sides, with very sparse piliferous punctures. Facial pilosity composed of thicker and slightly flattened setae, which tend to hide the surface somewhat. Species associated with *Salix* but host unknown ..... 71
- 71 Ovipositor sheaths as long as or slightly longer than gaster, index 1.85-1.95. Antenna (fig. 139) with F1 twice as long as the anellus and always provided with sensilla ..... *T. lampros* Graham
- Ovipositor sheaths 0.65-0.75 length of gaster, index 1.15-1.6. Antenna (fig. 179) with F1 1.5 times as long as the anellus and sometimes lacking sensilla ..... *T. pulchellus* Thomson
- 72 Forewing: speculum very small, not extending under the parastigma; basal and costal cells wholly pilose. Legs black, with only knees and extreme base of tarsi obscurely testaceous. Legs short and stout; hind femur about 3.3 times as long as broad; spur of hind tibia about 0.45 length of basitarsus. Ovipositor sheaths about 1.4 times length of gaster; index about 2.0 ..... *T. apiomyiae* Boucek & Mihajlovic
- Forewing: speculum always extending under the parastigma; basal cell rarely wholly pilose, sometimes bare, costal cell rarely entirely pilose. Legs relatively paler (except in *T. nigratarsus*, in which they are longer and more slender, with hind femur 3.7-4.0 times as long as broad, spur of hind tibia 0.3-0.35 length of basitarsus, ovipositor sheaths about as long as body) ..... 73
- 73 Head (fig. 215) only 1.7 times as broad as long, with temples 0.3 length of eyes. Ovipositor about as long as metasoma plus half mesosoma, index 3.0. Antenna

- (fig. 217) with F1 distinctly shorter than F2, flagellum proximally less broad than pedicellus, but thickening obviously distad. [All femora and tibiae infusate. Small species: length 1.7 mm] ..... *T. spherocephalus* spec. n.
- Head normally at least twice as broad as long, but if resembling that of above than temples shorter, ovipositor index at most 2.8, F1 not shorter than F2 and flagellum slightly thicker proximally ..... 74
- 74 Forewing: basal cell, on upper surface of wing, wholly or (*T. juniperi*) at least its upper half, pilose; speculum small. Lateral ocelli small, OOL 1.4-2.0 times OD. Ovipositor sheaths at least as long as metasoma plus half mesosoma, index 2.1-3.5. Antennal scape normally black with at most its extreme base testaceous, occasionally reddish beneath in *juniperi*. [Propodeal spiracles rather small, 1.6-1.7 times as long as broad] ..... 75
- Forewing: basal cell, on upper surface of wing, most often bare or with a row of setae below SM; if (*T. heyeri, arcticus, helveticus*) mainly pilose then either ovipositor index at most 1.5 and not or hardly longer than gaster; or (a very few other species) lateral ocelli larger, antennal scape yellowish beneath ..... 76
- 75 Ovipositor sheaths from nearly as long as, to very slightly longer than, the body; index 2.9-3.5. Legs black with at most knees, and bases of basitarsi, testaceous. Basal cell of forewing wholly pilose, or with only a narrow bare strip in lower part ..... *T. nigratarsus* (Walker)
- Ovipositor sheaths as long as gaster plus half to two-thirds of the thorax; index 2.1-2.4. Coxae black; apices of hind femora narrowly testaceous, fore and mid femora apically or wholly testaceous; tibiae varying from testaceous to mainly black; mid and hind tarsi testaceous, gradually darkening towards their tips. About upper half of basal cell of forewing pilose ..... *T. juniperi* (Linnaeus)
- 76 Ovipositor sheaths 1.7-2.37 times as long as body. Mesoscutum, axillae and scutellum excessively finely reticulate, with widely separated, very small piliferous punctures. Head in front view nearly circular. [Spurs of hind tibia rather short, the longer one at most 0.35 length of basitarsus (fig. 50). Propodeal spiracles small, 1.5-1.6 times as long as broad] ..... *T. caudatus* Boheman
- Ovipositor sheaths at most 1.5 times as long as body. Mesoscutum, axillae and scutellum with stronger reticulation, sometimes with piliferous punctures larger or more numerous ..... 77
- 77 Spurs of hind tibia (fig. 178) very unequal, the shorter spur at most 0.5 the length of the longer spur, which is not greater than the breadth of the tibia. Dorsal surface of hind coxa with 1-2 setae in basal half. Hypopygium short, projecting only slightly beyond the basal sternite of the gaster (occasional aberrations of *T. microcerus*) ..... 70
- Spurs of hind tibia not so very unequal, the shorter spur more than 0.5 the length of the longer spur (if only 0.6, as in *T. giraudianus*, then dorsal surface of hind coxa with many setae in basal half). Hypopygium usually longer ..... 78
- 78 Species with the following combination of characters: mesoscutum and scutellum (fig. 41) with relatively conspicuous piliferous punctures, which on mesoscutum and basal part of scutellum are mostly separated by less than twice their diameter; ovipositor sheaths at least as long as gaster plus thorax, sometimes slightly longer than whole body; index at least 2.85; temples (fig. 40) converging strongly,

- straight or very weakly curved; lateral ocelli large, OOL equal to OD (slightly greater in dwarfs). [genae, in front view of head straight] ..... 79
- Species either with less conspicuous or more widely-spaced piliferous punctures on mesoscutum and scutellum; or with shorter ovipositor sheaths; or with temples converging less strongly and often curved; lateral ocelli usually smaller, often with OOL at least a little greater than OD ..... 81
- 79 Gaster not pale-marked but mainly coppery or fiery over at least posterior half (weakly in some dwarfs). Malar space 0.32-0.36 length of eye. Forewing sometimes more or less infumate discally. Hosts in *Rosa* -galls ..... *T. bedeguaris* (Linnaeus)
- Gaster either with a reddish or testaceous subbasal band at least on the sides; or else without coppery or fiery colour except sometimes on the middle segments. Malar space 0.23-0.30 length of eye. Forewing hyaline. Hosts in *Quercus* galls ... 80
- 80 Ovipositor index 2.65-3.3, sheaths usually as long as gaster plus thorax, rarely as long as body. Gaster normally with pale subbasal band, at least at sides. Legs tending to be more reddish-testaceous, especially the femora (which are rarely dark-marked) ..... *T. geranii* (Walker)
- Ovipositor index 3.4-4.3, sheaths as long as or very slightly longer than body;. Gaster immaculate, blue-green, green or golden-green, with sometimes a little coppery tinge on middle segments. Legs paler testaceous or yellow, with hind femora often brown or broadly black medially ..... *T. auratus* (Müller)
- 81 Ovipositor sheaths 1.1-1.4 length of body; index 3.9-5.0. [POL 1.6-1.8 times OOL. Tip of hypopygium at 0.75-0.85 length of gaster] ..... 82
- Ovipositor sheaths at most hardly as long as body; index 0.7-3.55 ..... 85
- 82 Malar space 0.27-0.28 length of eye. Mouth 2.5-2.6 malar space. Ovipositor sheaths 1.25-1.4 length of body, with index 4.5-5.0. [Scape mainly to wholly and legs apart from coxae, testaceous] ..... *T. hylesini* Graham
- Malar space 0.3-0.35 length of eye. Mouth 2.1-2.65 malar space. Ovipositor sheaths 1.1-1.25 length of body; index 3.9-4.6 ..... 83
- 83 Legs yellow with fore coxae sometimes partly to mainly dark, sometimes hind femora infusate. Antenna with anellus quadrate ..... *T. seminum* (Hoffmeyer)
- Legs reddish-testaceous with all coxae dark, sometimes all femora infusate. Antenna with anellus slightly broader than long ..... 84
- 84 Head (fig. 128) with temples distinctly curved. Antennal scape not reaching anterior ocellus. Hind coxa less than 2.7 times as long as broad. Forewing with ST not very oblique ..... *T. impar* (Rondani)
- Head with temples less curved. Antennal scape reaching at least to lower edge of anterior ocellus. Hind coxa about 2.7 times as long as broad, its posterior edge less curved. Forewing with ST strongly oblique ..... *T. borealis* Thomson
- 85 Spurs of hind tibia (fig. 52) short, the longer spur only 0.3-0.33 length of basitarsus. Antennal scape black, or at most the radícula and extreme base pale. Forewing 2.5-2.7 times as long as broad. Mesosoma mainly bronze, coppery, or greenish-bronze. [Ovipositor sheaths at least slightly longer than gaster, sometimes nearly as long as body, species associated with *Salix*, occasionally *Populus* ] ..... 86
- Spurs of hind tibia usually 0.4-0.55 length of basitarsus, if only 0.3-0.33 (*T. lapsanae*) then antennal scape yellow ventrally or more extensively so, forewing hardly

- 2.5 times as long as broad, body blue to blue-green ..... 88
- 86 Ovipositor sheaths almost as long as body; index 3.0-3.35. Antenna (fig. 105) with flagellum tending to be more cylindrical, only the clava a little broader than F7. POL 1.8-2.1 times OOL ..... *T. fuscipes* Boheman
- Ovipositor sheaths at most as long as gaster plus half thorax; index 1.9-2.5. Antennal flagellum (fig. 51) slender proximally but thickening distinctly distad. POL 1.75-1.85 times OOL ..... 87
- 87 Head in dorsal view (fig. 53) 2.1-2.5 times as broad as long. Eyes separated by 1.2-1.25 times their length. POL 1.4-1.7 times OOL. Femora mainly black, tibiae and tarsi more or less extensively infuscate. (Antenna fig. 51) Associated with *Salix*. ....  
..... *T. chlorocopes* Boheman
- Head in dorsal view 1.75-2.0 times as broad as long. Eyes separated by 1.0-1.1 times their length. POL 1.7-1.85 times OOL. Femora at most infuscate proximally, tibiae and tarsi yellowish-testaceous. Associated with *Populus* and *Salix* .....  
..... *T. giraudianus* (Hoffmeyer)
- 88 Species with the following combination of characters: genae, in front view of head (fig. 12) distinctly curved; head appearing nearly circular; ovipositor sheaths as long as gaster plus two thirds of thorax or slightly more, index 2.7-3.0; legs, including fore coxae partly to mainly, testaceous; occasionally hind femora darkened, rarely also hind tibiae. [Longer spur of hind tibia 1.4-1.55 times apical breadth of the tibia] Host *Megaselia* sp. (Dipt.) on *Acer* ..... *T. aceris* Bouček
- Genae, in front view of head, in most species straight or virtually so; if distinctly curved then either the ovipositor index is at most 2.4, or at least hind femora are mainly black and other parts of legs sometimes infuscate ..... 89
- 89 Genae distinctly curved. Ovipositor index about 2.8. Head (fig. 48) about 1.6 times as broad as long; POL about 2.4 times OOL ..... *T. capitonis* spec. nov.
- If genae are distinctly curved, than ovipositor index is at most 2.4 and/or POL is at most 2.0 times OOL. Head most often twice as broad as long, if broader, than the ovipositor index is not more than 2.2 ..... 90
- 90 Ovipositor index 2.7-3.55, sheaths about as long as metasoma plus three quarters to whole of mesosoma ..... 91
- Ovipositor index 0.5-2.6, sheaths at most as long as metasoma plus two thirds of mesosoma but often shorter than this ..... 98
- 91 Longer spur of hind tibia 0.3-0.33 length of basitarsus. [Legs yellow] .....  
..... *T. lapsanae* (Hoffmeyer)
- Longer spur of hind tibia 0.4-0.45 length of basitarsus ..... 92
- 92 OOL 1.4-1.5 times OD. Genae, in front view of head, weakly curved. Anterior margin of clypeus broadly but shallowly emarginate. Ovipositor index 2.7-2.75. [Host on *Salix*] ..... *T. narvikensis* Graham
- OOL 1.0-1.3 times OD. Genae, in front view of head, straight. Anterior margin of clypeus truncate, or curved slightly forwards. Ovipositor index 2.75-3.55. .... 93
- 93 Tip of hypopygium very nearly level with apex of gaster (as in *T. cupratus*, fig. 72). [Legs, including fore coxae mainly yellow] ..... *T. arcella* spec. nov. [note: if fore coxae dark, ovipositor index hardly 2.7, see *cultratus*, couplet 121]
- Tip of hypopygium more remote from apex of gaster ..... 94
- 94 Legs, except mid and hind coxae partly, testaceous, only occasionally hind femora

- slightly darkened medially. Head (fig. 168) with temples 0.17-0.18 times apparent length of eyes [converging very strongly] ..... 95
- At least hind femora broadly black medially, hind tibiae and fore coxae most often mainly to wholly dark. Head with temples 0.2-0.32 apparent length of eyes ..... 96
- 95 Scutellum (fig. 238) with piliferous punctures of anterior third moderate-sized and less than twice their diameter apart. Host: *Wachtliella rosarum* on *Rosa* ..... *T. wachtliellae* spec. nov.
- Scutellum (fig. 169) with piliferous punctures small or very small, separated by more than twice their diameter. Host on *Salix* ..... *T. partitus* spec. nov.
- 96 Anterior margin of clypeus curved slightly forwards. Mouth 1.75-1.95 malar space. Pedicellus plus flagellum 1.35-1.55 breadth of head. Length 2.3-4.0 mm ..... *T. chloromerus* (Walker)
- Anterior margin of clypeus broadly truncate. Mouth about 2.0 malar space. Pedicellus plus flagellum sometimes shorter. Length 1.5-2.6 mm ..... 97
- 97 Pedicellus plus flagellum 1.28-1.35 breadth of head. POL 1.9-2.1 times OOL. Host: *Rhopalomyia valerii* on *Juniperus oxycedrus* in Spain ..... *T. valerii* spec. nov.
- Pedicellus plus flagellum 1.17-1.25 breadth of head. POL slightly less than 1.9 times OOL. Host: on *Artemisia* ..... *T. artemisiae* Mayr
- 98 Forewing with basal cell pilose, except for a very narrow strip above its lower border; wing beyond speculum rather thickly pilose. Mesoscutum, axillae and scutellum shiny, their piliferous punctures minute and far apart. Antennal anellus quadrate. Eyes with rather long setae (as in *T. chrysocephalus*, fig. 60). Malar space 0.43-0.47 length of eye. Ovipositor sheaths slightly shorter than gaster, index about 1.2 ..... *T. arcticus* (Thomson)
- Forewing with basal cell rarely so extensively pilose, often nearly bare; if mainly pilose, then mesoscutum and scutellum relatively dull, with more numerous punctures. Anellus broader than long. Eyes with extremely short setae. Malar space rarely so long. Ovipositor sheaths sometimes longer than gaster ..... 99
- 99 Upper two thirds or more of basal cell of forewing pilose. Malar space 0.38-0.40 length of eye. Ovipositor sheaths slightly shorter than gaster, index 1.0-1.1. Antennal scape black; funicle (fig. 118) proximally slightly stouter than pedicellus ..... *T. helveticus* spec. nov.
- Basal cell of forewing usually bare or with only a few setae just below SM; if (*T. heyeri*) as extensively pilose as in *helveticus*, then malar space shorter, ovipositor sheaths as long as gaster with index 1.3-1.6 and antennal funicle proximally not stouter than pedicellus ..... 100
- 100 Head in front view (fig. 73) subtriangular, nearly as high as broad; lower edge of antennal toruli only slightly above ventral edge of eyes. Malar space 0.43-0.45 length of eye. Tip of hypopygium (fig. 72) situated 0.8-0.85 length of gaster; ovipositor sheaths hardly, or only just, as long as gaster. Antennal scape black, with at most the radícula paler. Thorax and gaster bronze-green to coppery-bronze ..... *T. cupratus* Boheman
- Head in front view broader than high, with lower edge of toruli distinctly above ventral edge of eyes. Malar space less than 0.4 length of eye except in *T. crassiceps* which has the ovipositor sheaths longer than gaster; and in *phillyreae*, which has

- tip of hypopygium more remote from apex of gaster, scape more or less pale beneath, thorax and gaster green to blue, or violet ..... 101
- 101 Species with following combination of characters: ocelli very small, OOL 2.0-2.1 times OD; antennae (fig. 130) with F1 distinctly to much longer than broad, anellus quadrate, closely applied to F1; scape black, or with at most extreme base and radicula pale; forewing 2.7-2.75 times as long as broad, costal cell 10-10.5 times as long as broad, bare above; mesoscutum and scutellum shiny, with small, widely-separated piliferous punctures; about posterior 0.2 of scutellum virtually smooth between the punctures ..... *T. imperatrix* spec. nov.
- Ocelli larger, OOL 1.0-1.6 times OD. Antenna with F1 usually not distinctly longer than broad, anellus often broader than long, scape nearly always more or less pale beneath. Forewing usually less elongate, costal cell usually broader, sometimes more or less pilose above. Mesoscutum and scutellum relatively dull, sometimes with larger punctures. Posterior part of scutellum alutaceous or reticulate ..... 102
- 102 Mesosoma (fig. 220) notably elongate, 2.25-2.4 times as long as broad. Ovipositor sheaths barely as long as gaster. Host on *Agrostis* (Gramineae) .... *T. stenus* Graham
- Mesosoma at most twice, usually slightly less than twice, as long as broad. Ovipositor sheaths sometimes relatively longer. Hosts (where known) on other plants ..... 103
- 103 Ovipositor index 0.55-1.05, sheaths at least slightly shorter than gaster. (unless the latter is telescoped). Antenna (fig. 45) with flagellum proximally not or only just as stout as pedicellus, but thickening strongly distad; F1 often slightly shorter than F2. Gaster usually bronze over posterior half or more. Small species, length 1.5-2.3 mm ..... 104
- Ovipositor index is 1.3 or more; it is at least 1.15 in some *microstigma* which has antennal flagellum weakly clavate to nearly cylindrical while the body length is greater. Other species either have the ovipositor sheaths relatively longer, or the antennal flagellum different in shape ..... 105
- 104 Ovipositor sheaths 0.4-0.6 length of gaster, index 0.55-0.65 ..... *T. brachyurus* Boheman
- Ovipositor sheaths 0.7-0.85 length of gaster, index 0.9-1.05 ..... *T. pascuorum* Boucek
- 105 Head (figs 47, 67) in dorsal view only 1.7-1.8 times as broad as long; temples 0.37-0.45 length of eyes, conspicuously rounded. Spur of hind tibia 0.40-0.52 length of basitarsus. [Malar space 0.37 length of eye] ..... 106
- Head in dorsal view normally at least twice as broad as long and with temples at most 0.33 length of eyes; often more convergent and less curved; if shaped as in alternate (*T. quadriceps*) then temples at most 0.33 length of eyes, spur of hind tibia relatively shorter ..... 107
- 106 Antenna (fig. 47) with pedicellus plus flagellum 1.1 times breadth of head; pedicellus about 1.6 times as long as broad; F3-F7 slightly transverse. Ovipositor index about 2.0..... *T. caledonicus* spec. nov.
- Antenna (fig. 67) with pedicellus plus flagellum 1.3 times breadth of head; pedicellus about 1.8 about times as long as broad; only F6-F7 or F5-F7 slightly transverse. Ovipositor index 2.2 ..... *T. crassiceps* spec. nov.
- 107 Antenna with scape reaching at least level of middle of anterior ocellus or above this, its length equal to transverse diameter of eye; anellus quadrate or virtually

- so. Ovipositor sheaths somewhat longer than gaster, index 2.0-2.55 ..... 108
- Antennal scape rarely reaching middle of anterior ocellus; anellus often broader than long. Ovipositor sheaths various ..... 109
- 108 Ovipositor index 2.0-2.27. Body green. Head (fig. 167): posterior edge of anterior ocellus just touches an imaginary line between anterior edges of lateral ocelli .....  
..... *T. paludum* spec. nov.
- Ovipositor index 2.4-2.55. Body mainly coppery-bronze. Head (fig. 188): the posterior edge of the anterior ocellus passes a little an imaginary line between anterior edges of lateral ocelli ..... *T. rhamni* Boucek
- 109 Malar space 0.40-0.46 length of eye; mouth only 1.55-1.75 malar space. Setae of mesoscutum (fig. 173) dense, very short, decumbent; those of scutellum similar, except near the hind margin where they are somewhat longer. Head (fig. 171) with temples converging very strongly and weakly curved. Face below toruli thickly clothed with silvery-white downward pointing setae; similar setae on sides of face above toruli, but pointing obliquely outwards. Hind coxa dorsally with at most seven setae in a single or slightly irregular row. Gena wholly alutaceous, the sculpture extending to or virtually to the malar sulcus on its posterior side. Legs mainly testaceous, including fore coxae more or less; at most hind femora and tibiae infusate ..... *T. phillyreae* Ruschka
- Malar space at most 0.37 length of eye except in some *T. frater*, which have setae of mesoscutum and scutellum longer and slightly raised, temples converging less strongly and curved, face with pilosity less dense and less conspicuous, fore coxae dark and femora infusate, and some *ruschkai* which have scutellar setae longer and somewhat raised, hind coxa dorsally thickly pilose in basal half (8-15 setae in a double row), gena (fig. 197) with a smooth, bare wedge immediately posterior to the malar sulcus. Mouth (except in *chloromerus* and *ruschkai*) at least 1.75 malar space ..... 110
- 110 Genae, in front view of head (fig. 192) appearing distinctly curved; head tending towards a circular shape. Antennal anellus quadrate or only very slightly broader than long ..... 111
- Genae, in front view of head, straight or nearly so (fig. 194); head more trapeziform. Antennal anellus sometimes distinctly broader than long ..... 118
- 111 Head (fig. 68) 2.05-2.15 times as broad as long; temples converging rather strongly, weakly curved. Mesoscutum, axillae and scutellum shiny, with minute, sparsely distributed piliferous punctures (especially the scutellum) .....  
..... see *T. cultriventris* Ratzeburg (couplet 131)
- Head (fig. 191, 203) normally at most twice as broad as long, with temples converging rather less strongly and more distinctly curved; if approaching the shape seen in *T. cultriventris* then mesoscutum and scutellum dull ..... 112
- 112 Longer spur of hind tibia short, its length slightly less than breadth of tibia; legs very dark, femora mainly black, at least hind tibiae more or less infusate. Antennal scape black, or obscurely testaceous beneath. Head and mesosoma blue to violet. .... see *juniperi* (L.) (couplet 75)
- Longer spur of hind tibia with length at least equal to breadth of tibia; legs usually more extensively pale. Antennal scape usually yellowish beneath or more extensively so. Head and mesosoma usually differently coloured ..... 113

- 113 Antennal pedicellus about twice as long as broad. Scutellum with numerous piliferous punctures. At least posterior half of gaster, often also sides of mesosoma, golden to coppery. Ovipositor index 2.0-2.05. Antenna (fig. 112) ..... *T. gloriosus* spec. nov.
- Pedicellus usually less than twice as long as broad, if not then ovipositor index at least 2.15. Mesosoma and metasoma normally green to blue, rarely with weak brassy tinge in places ..... 114
- 114 Ovipositor index 1.7-2.05 ..... 115
- Ovipositor index 2.15-2.4 ..... 116
- 115 Temple (fig. 203) 0.33 apparent length of eyes. Anellus transverse. Hind femur about 4.0 times as long as broad. Host unknown ..... *T. scandicus* spec. nov.
- Temple (fig. 191) 0.25-0.28 apparent length of eyes. Anellus subquadrate. Hind femur 3.6-3.8 times as long as broad. Host on *Salix* ..... *T. rosariae* spec. nov.
- 116 Mouth about 2.0 malar space. Host on *Salix* ..... *T. curvatus* spec. nov.
- Mouth at least slightly larger than twice malar space. Hosts on other plants .... 117
- 117 Scutellum (fig. 133) narrowing to base. Head 1.15-1.2 times as broad as mesoscutum. Host in cones of *Chamaecyparis* ..... *T. janetiellae* spec. nov.
- Scutellum (fig. 141) broader at base. Head not or hardly broader than mesoscutum. Host on *Larix* ..... *T. laricis* Boucek
- 118 Piliferous punctures of mesoscutum and scutellum (fig. 223) moderate-sized, rather close, especially on anterior part of scutellum where they are separated by at most twice their diameter [ovipositor index 2.1-2.4] ..... 119
- Piliferous punctures of mesoscutum and scutellum smaller or minute, usually less close together, on scutellum usually widely separated ..... 120
- 119 Mouth 2.3-2.6 malar space. Head (fig. 193) with temples converging very strongly. Malar space 0.26-0.29 length of eye. Ocelli larger: OOL at most 1.05 times OD. Hypopygium with a number of setae along its length. All legs, including coxae, yellow. Host usually on *Rubus*, occasionally on *Rosa*, rarely on *Pteridium* ..... *T. rubi* (Schrank)
- Mouth 1.8-1.9 malar space. Head (fig. 222) with temples converging only moderately. Malar space 0.31-0.37 length of eye. Ocelli smaller: OOL 1.25-1.3 times OD. Hypopygium bare except at tip. Femora dark, mid and hind tibiae infuscate. Host on *Thymus* ..... *T. thymi* Ruschka
- 120 Ovipositor sheaths as long as metasoma plus half to two thirds of mesosoma and/or 2.05-2.6 length of hind tibia ..... 121
- Ovipositor sheaths from shorter than gaster, to about length of metasoma plus one third of mesosoma; usually 1.15-1.9 length of hind tibia, rarely 2.0 ..... 146
- 121 Gaster with tip of hypopygium nearly level with apex of gaster, ovipositor index about 2.6 [Turkey] ..... *T. cultratus* spec. nov.
- Gaster with tip of hypopygium situated at about 0.8 length of gaster, ovipositor index often less ..... 122
- 122 Antenna (fig. 152) with flagellum more clavate, relatively slender proximally but the clava at least 1.5 times as broad as F1. [Very small to small species, length 1.5-2.2 mm. Body blue-green] ..... 123
- Antenna (figs 180, 228, 236) with flagellum weakly clavate to nearly filiform, relatively thicker proximally, clava at most 1.5 times as broad as F1 ..... 124



- 123 POL 1.8-2.0 times OOL. Genae in front view of head, slightly curved. Host on *Chamaecyparis* ..... *T. janetiellae* spec. nov.
- POL 2.1-2.55 times OOL, genae straight. Host on *Achillea* ..... *T. millefolii* Ruschka
- 124 POL 1.35 times OOL. Scape distinctly shorter than transverse diameter of eye, black with at most extreme base paler. Tegulae black. Femora mainly black, tibiae broadly infusate ..... *T. breviscapus* spec. nov.
- POL 1.65-2.5 times OOL. Scape not so dark and at least 0.9 times as long as transverse diameter of eye. Tegulae and/or femora more or less yellow ..... 125
- 125 POL 1.65-1.85 times OOL; OOL 1.4-1.6 times OD. Medium or small species: 1.5-2.4 mm ..... 126
- Either POL at least 2.0 times OOL; or OOL at most 1.25 times OD; or species at least 2.5 mm ..... 128
- 126 Larger species: 2.2-2.4 mm, host on *Salix* [ovipositor index 1.85-2.1] ..... *T. bouceki* spec. nov.
- Smaller, host not on *Salix* ..... 127
- 127 Ovipositor index 2.4-2.5 ..... *T. ulmariae* Ruschka
- Ovipositor index about 2.0 ..... *T. veronicae* Ruschka
- 128 Ovipositor index 2.5-2.6. POL 1.70-1.75 OOL; OOL 1.3-1.4 times OD. Femora mainly yellow, at most with a faint brownish streak. F1 approximately as long as pedicellus and 1.4-1.57 as long as broad. Host on *Salix* ..... *T. purpureae* spec. nov.
- Either ovipositor index at most 2.4; or POL at least 2.0 OOL; or OOL at most 1.15 times OD; or hind femora extensively black (sometimes more than one of these characters are present in combination) ..... 129
- 129 Legs yellow-testaceous, with only basal 0.5-0.66 of hind coxae, mid coxae more or less, and bases of fore coxae, dark. Femora and tibiae yellow. Mouth 2.1-2.35 malar space. Host: *Lasioptera rubi* ..... *T. eadyi* spec. nov.
- Hind coxae wholly dark, or very narrowly yellow at tip only. Fore coxae dark or pale. Femora and tibiae sometimes more or less infusate. Mouth 1.75-2.25 times as large as malar space. .... 130
- 130 Canary Island species. Spur 0.34-0.36 length of basitarsus. Mouth 1.75-1.85 malar space. Legs including fore coxae more or less yellow. Ovipositor index 2.4-2.6 ..... *T. halimi* spec. nov.
- European species, not having the above combination of characters ..... 131
- 131 Spur of hind tibia about 0.36 length of basitarsus. Host on *Fagus* ..... *T. cultriventris* Ratz.
- Length of spur of hind tibia 0.4-0.7 length of basitarsus. Hosts not on *Fagus* ..... 132
- 132 Mouth 1.75-1.8 length of malar space. Smaller species: 1.5-2.2 mm ..... 133
- Mouth usually at least 2.0 malar space, if slightly less (*T. chloromerus*, *arcadius*) than larger species: 2.3-4.0 mm ..... 134
- 133 Ovipositor index 2.25-2.32, host on *Tanacetum* ..... *T. tanaceticola* Ruschka
- Ovipositor index about 2.0, host on *Artemisia* ..... *T. ruschkai* (Hoffmeyer)
- 134 Mouth slightly less than 2.0 malar space ..... 135
- Mouth 2.0-2.2 malar space ..... 136
- 135 Pedicellus plus flagellum 1.25-1.45 breadth of head; flagellum (fig. 56) more slender; proximal funicular segments slightly elongate or quadrate, at most F7 very slightly transverse. Apparently a polyphagous species, on Diptera Tephritidae

- and Cecidomyiidae, also some Hymenoptera Cynipidae, especially on Asteraceae. Widespread and common ..... *T. chloromerus* (Walker)
- Pedicellus plus flagellum 1.1-1.15 times breadth of head; flagellum stouter; proximal funicular segments quadrate, distal segments very slightly transverse. Biology unknown. Greece. .... *T. arcadius* spec. nov.
  - 136 OOL about 1.3 times OD. Host on *Polygonum* ..... *T. persicariae* Mayr
  - OOL 1.0-1.2 times OD. Host not on *Polygonum* ..... 137
  - 137 Hypopygium with a group of 12-15 setae before its tip. Forewing: upper surface of costal cell with a complete row of setae. [Legs pale, ovipositor index 2.25-2.5]. Host on *Prunus* ..... *T. putoniellae* spec. nov.
  - Hypopygium with at most 9 setae (in *T. fractiosus* spec. nov.) but usually not more than 6, before its tip. [The forewing costal cell upper surface in *fractiosus* has the row of setae narrowly to widely broken medially]. Host on other plants ..... 139
  - 138 Anellus quadrate or virtually so ..... 139
  - Anellus slightly to distinctly broader than long (ratio usually 1.3-1.5) ..... 140
  - 139 Ovipositor index 2.15-2.5. Sides of upper face with few and minute punctures. Host on *Crataegus* ..... *T. anthobiae* Ruschka
  - Ovipositor index 2.5-2.6. Sides of upper face with several small but distinct punctures. Host on *Verbascum* ..... *T. verbasci* Ruschka
  - 140 Antennal flagellum (fig. 122) moderately clavate. Host on *Origanum* .....  
..... *T. hornigi* Ruschka
  - Antennal flagellum weakly clavate. Hosts on other plants ..... 141
  - 141 Forewing: M 3.5 times PM. Anterior margin of clypeus (fig. 255) broad, hardly produced forwards, very shallowly emarginate. [Ovipositor index 2.12]. Host on *Salix* ..... *T. heterobiae* spec. nov.
  - Forewing: M 3.7-4.7 times PM. Anterior margin of clypeus (fig. 248) produced slightly forwards to form a narrower lobe which is usually slightly curved or narrowly emarginate. Hosts not on *Salix* ..... 142
  - 142 Pedicellus plus flagellum at most 1.2 breadth of head. Sides of upper face with numerous and rather close, though small, punctures. Palpi testaceous. Host on *Galeobdolon* ..... *T. galeobdolonis* spec. nov.
  - Pedicellus plus flagellum 1.2-1.3 breadth of head; if (*T. pastinacae*) only 1.2 then sides of upper face with less numerous and less distinct punctures and the palpi are brownish ..... 143
  - 143 Malar space 0.4 length of eye. OOL at least 1.2 times OD .....  
..... see *T. chloromerus* couplet 135
  - Malar space less than 0.4 length of eye. OOL at most 1.15 times OD ..... 144
  - 144 Malar space 0.28-0.3 length of eye. M 3.7-3.8 times PM. Host on *Rosa* spp. ....  
..... *T. fractiosus* spec. nov.
  - Malar space 0.33-0.37 length of eye. M 3.8-4.3 times PM. Hosts on other plants ....  
..... 145
  - 145 Palpi yellow. Anellus only slightly transverse. Sides of upper face with fairly numerous and moderately distinct small punctures. Host on *Chamaenerion angustifolium*. Ovipositor index 2.1-2.5 ..... *T. epilobii* spec. nov.
  - Palpi brownish. Anellus 1.3-1.5 times as broad as long. Sides of upper face with sparse, indistinct punctures. Hosts on *Pastinaca* and *Peucedanum*. Ovipositor index

1.9-2.1 .....	<i>T. pastinacae</i> spec. nov.	
146 Ovipositor index approximately 2.0 and sheaths about as long as gaster plus one third of thorax or slightly more .....		121
- Ovipositor index 1.15-1.9 and at most slightly longer than gaster .....		147
147 Antennal flagellum (figs 120, 153, 182) proximally not or only just as stout as pedicellus, but thickening obviously distad so that the clava is about twice as broad as F1, which is sometimes slightly shorter than F2; pedicellus 1.8-2.0 times length of F1; distal segments of funicle usually slightly broader than long. Body-length 1.2-2.1 mm. Gaster often partly or mainly bronze .....		148
- Antennal flagellum usually filiform or weakly clavate, proximally at least slightly stouter than pedicellus; if ( <i>T. socius</i> , <i>curtisi</i> ) approaching the condition of alternate, then pedicellus at most 1.6 length of F1, body-length 1.4-3.0 mm, gaster bright blue to greenish-blue .....		152
148 Antenna (fig. 182) with funicle segments approximately quadrate, F1 apparently lacking sensilla. Gaster strongly compressed. Hind coxa dorsally with only two setae in basal half .....	<i>T. pygmaeus</i> Mayr	
- Antenna (fig. 153) with distal segments of funicle slightly broader than long, or F1 with at least one sensillum. Gaster not strongly compressed. Hind coxa dorsally (- except in ? <i>T. anastativorus</i> ) with more than two setae in basal half .....		149
149 M 12-13 times length of ST; basal cell of forewing almost bare. Gaster blue-green. Mesoscutum and scutellum shiny, scutellum with sculpture of its posterior 0.25 obsolescent. Hind coxa dorsally with only two setae in basal half in the single female seen .....	? <i>T. anastativorus</i> Fahringer	
- Forewing with M 6-9.5 times length of ST; basal cell partly to wholly pilose. Gaster usually with at least a small bronze area. Mesoscutum and scutellum dull, scutellum posteriorly with distinct sculpture. Hind coxa dorsally with five or more setae in basal half .....		150
150 Ovipositor sheaths slightly longer than gaster, index 1.7-1.9. Antenna (fig. 153) with funicular segments quadrate, or at most F7 slightly broader than long .....	<i>T. monticola</i> spec. nov.	
- Ovipositor sheaths approximately as long as gaster (in one female slightly shorter), index 1.3-1.6. Segments of funicle (5-) 6-7 slightly broader than long .....		151
151 Head (fig. 121) about twice as broad as long. Gaster, except at base, purplish-bronze. Antenna (fig. 120). Forewing: speculum often closed below .....	<i>T. heyeri</i> Wachtl	
- Head (fig. 183) 1.8-1.9 times as broad as long. Gaster at most purplish-bronze medially. Forewing: speculum open below .....	<i>T. quadriceps</i> spec. nov.	
152 Longer spur of hind tibia 1.8 times breadth of the tibia and 0.5 length of basitarsus; [the latter 0.5 length of tibia and 6.3 times as long as broad. Ovipositor index 1.45] .....	<i>T. centor</i> spec. nov.	
- Longer spur of hind tibia at most 1.5 breadth of tibia and at most 0.47 length of basitarsus .....		153
153 Antennal scape reaching level of middle of anterior ocellus, or slightly above this, its length about equal to transverse diameter of eye .....		154
- Antennal scape reaching at most to lower edge of anterior ocellus, its length usually at least slightly less than transverse diameter of eye .....		157

- 154 Head, mesosoma and metasoma with some violet areas. Antennal anellus quadrate. Head (fig. 212) strongly transverse; temples converging strongly. OOL about 1.3 times OD. [Coxae, and femora more or less, dark] ..... *T. spaici* Boucek
- Head and mesosoma green, blue-green, or brassy-green; metasoma similarly coloured. Anellus at least slightly broader than long. Head less transverse or with temples converging less strongly. OOL 0.87-1.2 times OD ..... 155
- 155 Head (fig. 25) with temples converging very strongly and only 0.15-0.16 length of eyes. Posterior edge of anterior ocellus slightly below an imaginary line touching anterior edge of lateral ocelli; OOL slightly less than OD. Ovipositor index 1.75-1.8. Host *Arge* sp. .... *T. argei* Boucek
- Head (fig. 174) with temples converging less strongly. Posterior edge of anterior ocellus lies upon an imaginary line touching anterior edge of lateral ocelli; OOL equal to or slightly greater than OD. Ovipositor index at most 1.65 ..... 156
- 156 Ovipositor sheaths slightly shorter than gaster, index 1.15. Legs, including fore coxae more or less, yellow, with at most hind tibiae more or less darkened ..... *T. caudatulus* spec. nov.
- Ovipositor sheaths about as long as, or slightly longer than gaster, index 1.5-1.66. All coxae, and femora mainly, black; hind tibiae broadly infusate ..... *T. problematicus* spec. nov.
- 157 Head (fig. 103) with temples 0.33-0.37 apparent length of eyes, rounded and not converging strongly. POL 1.7-1.85 times OOL. Antenna (fig. 102) with F7 and sometimes F6 slightly broader than long. Mouth about 1.85 malar space. Ovipositor index 1.15-1.2, sheaths usually a little shorter than gaster .... *T. frater* Thomson
- Head in with temples 0.15-0.3 apparent length of eyes, usually converging more strongly. POL 1.8-2.6 times OOL. Mouth usually more than 1.85 malar space, if not then ovipositor index at least 1.4 ..... 158
- 158 Antenna (fig. 211) with pedicellus plus flagellum only 1.05-1.1 times breadth of head; flagellum distinctly clavate. Head (fig. 209) 2.1-2.25 times as broad as long. POL 2.25-2.6 times OOL ..... 159
- Antenna with pedicellus plus flagellum 1.2-1.4 times breadth of head; if less than 1.25 times, then either (*T. galii*) head only twice as broad as long; or (*T. microstigma*, *lythri*, *pastinacae*) with flagellum, not counting the clava, almost filiform. POL 1.8-2.5 times OOL ..... 160
- 159 Ovipositor index 1.1-1.4 (?-1.65). Mouth 2.05-2.25 malar space, the latter 0.3-0.35 length of eye. Host *Kiefferia pimpinellae* on *Pastinaca* ..... *socius* Mayr
- Ovipositor index 1.8-1.9. Mouth 1.85-1.9 malar space, the latter 0.36-0.37 length of eye. Host *Kiefferia pimpinellae* on *Daucus* ..... *T. curtisi* nom. nov.
- 160 POL about 1.8 times OOL. Body mainly violet-blue. Legs, except fore coxae more or less, testaceous, usually with at most hind femora infusate (rarely hind tibiae in small females). Host on *Lythrum* ..... *T. lythri* Boucek
- POL 1.9-2.5 times OOL. Body not violet-blue, or with at most very restricted flecks of that colour. Legs sometimes darker. Hosts (where known) on other plants ..... 161
- 161 Mouth 2.15-2.3 malar space. Antenna (fig. 63) with flagellum rather slender; at most F7 very slightly transverse. Host on *Urtica* ..... *T. confinis* (Walker)

- Mouth 1.5-2.05 malar space. Antennal flagellum sometimes otherwise. Host not on *Urtica* ..... 162
- 162 Mouth 1.75-1.8 malar space, the latter 0.37-0.4 length of eye. Ovipositor index 1.7-1.9. Antenna (fig. 153) with flagellum proximally not or only just as stout as pedicellus, but thickening distinctly distad, F1 quadrate. Legs dark: all femora, and at least mid and hind tibiae, more or less infusate ..... *T. monticola* spec. nov.
- If mouth is 1.8 malar space or less, then either (*T. cretaceus*) ovipositor index is at most 1.55, and legs are paler; or (*T. ruschkai*) flagellum (fig. 198) is proximally a little stouter than the pedicellus and thickens less distinctly distad, with F1 tending to be slightly elongate; the legs are paler, with fore coxae more or less yellow, at most hind femora mainly black and hind tibiae more or less infusate ..... 163
- 163 Mouth 1.5-1.8 malar space, the latter 0.35-0.37 length of eye ..... 164
- Mouth 1.9-2.0 malar space, the latter at most 0.35 length of eye ..... 165
- 164 Ovipositor index 1.8-2.0. Malar space about 0.37 length of eye. Host on *Artemisia*...  
..... *T. ruschkai* (Hoffmeyer)
- Ovipositor index 1.45-1.55. Malar space about 0.35 length of eye. Host unknown ..  
..... *T. cretaceus* spec. nov.
- 165 POL 2.2-2.5 times OOL. Head (fig. 150) 2.15-2.35 times as broad as long. Hosts on *Rosa* and *Prunus* ..... *T. microstigma* (Walker)
- POL either at most 2.1 times OOL, or, if slightly more (some *T. corni*) then head (fig. 64) about twice as broad as long. Hosts not on *Rosa* and *Prunus* ..... 166
- 166 Longer spur of hind tibia about 0.37 length of basitarsus. [Antenna with F5, F6 and F7 very slightly transverse]. Host on *Atriplex patula* .. *T. schizothecae* Ruschka
- Longer spur of hind tibia 0.4-0.45 length of basitarsus. Hosts on other plants .. 167
- 167 Ovipositor index 1.9-2.1. Fore coxae dark, or at most narrowly pale at tips. Antenna with at most F7 very slightly transverse. Host on *Pastinaca* and *Peucedanum* .....  
..... *T. pastinacae* spec. nov.
- Either ovipositor index at most 1.7; or fore coxae yellow, except sometimes at base; or (F5-) F6 and F7 are very slightly transverse ..... 168
- 168 Antenna: at most F7 slightly transverse. Fore coxae yellow, or dark at base only; all femora and tibiae usually yellow, at most hind femora and tibiae more or less infusate. Hosts on *Lathyrus*, *Viola* and *Rorippa* ..... *T. orobi* Mayr
- Either (F5-) F6 and F7 very slightly transverse; or legs darker, with fore coxae extensively to wholly black, hind femora mainly black, hind tibiae often wholly black ..... 169
- 169 Ovipositor index 1.4, host on *Lathyrus pratense* ..... *T. lathyri* spec. nov.
- Ovipositor index 1.6-1.9, host not on *Lathyrus* ..... 170
- 170 Antennal flagellum (fig. 107) proximally distinctly stouter than pedicellus. Fore and mid femora dark, sometimes also fore and mid tibiae. Hosts on *Galium* spp. ...  
..... *T. galii* Boheman
- Antennal flagellum (fig. 110) proximally only slightly stouter than pedicellus. Fore and mid femora rarely very slightly darkened ..... 171
- 171 Hosts on *Cornus sanguineum*. Antenna very slightly clavate: breadth of F1 nearly twice that of F7; malar space at most 0.3 times length of eye ..... *T. corni* Mayr
- Host(?)s on *Genista*. Antenna more filiform: breadth of F1 1.5 times that of F7; malar space slightly more than 0.3 times length of eye ..... *T. genisticola* Ruschka

### Key to some European males of the genus *Torymus*

- 1 Hind tibia with only one distinct spur. F1 anelliform, distinctly smaller than second and lacking sensilla; antennae inserted low on face, toruli distinctly nearer to anterior margin of clypeus than to anterior ocellus; outer surface of scape mainly smooth and polished. Mesoscutum and scutellum shiny, with very small sparse piliferous punctures. Hind coxa bare dorsally in basal half [Flagellum distinctly clavate. POL 1.9-2.1 times OOL] ..... 2
  - Hind tibia with two spurs. First funicular segment usually as long as or longer than second, if slightly shorter then either with sensilla or (*T. eglanteriae*) antennae are inserted higher, toruli hardly nearer to anterior margin of clypeus than to anterior ocellus, outer surface of scape is finely reticulate and mesoscutum and scutellum relatively dull, with more piliferous punctures ..... 3
- 2 Antennal scape (fig. 158) 2.6-2.78 times as long as broad; usually yellowish, occasionally slightly infuscate dorsally; rest of antenna orange-yellowish, pedicellus rarely infuscate dorsally ..... *T. nitidulus* (Walker)
  - Antennal scape (fig. 104) 2.15-2.45 times as long as broad, black with metallic tint; pedicellus black; flagellum brownish, with a black ring at the apical margin of each funicular segment or infuscate dorsally, sometimes wholly black ..... *T. fuscicornis* (Walker)
- 3 Posterior 0.25-0.35 of scutellum (frenum) devoid of setae and extensively to wholly polished and smooth and/or with posterior area delimited anteriorly by an impressed line ..... 4
  - Scutellum without any such differentiated portion, wholly reticulate (though occasionally this reticulation is weaker posteriorly) and with some setae in the posterior part ..... 18
- 4 Hind coxa slender, about 3.5 times as long as broad, its posterior edge hardly curved. Mesoscutum and scutellum rather shiny; piliferous punctures small and sparse ..... *T. azureus* Boheman
  - Hind coxa stouter, its posterior edge very distinctly curved ..... 5
- 5 Hind coxa externally in upper half smooth or nearly so and without a dorsal carina ..... *T. pulcher* Boucek
  - Hind coxa reticulate all over (in *T. calcaratus*, the hind coxa is partly smooth but it has a distinct dorsal carina) ..... 6
- 6 Hind femur with a tooth ventrally ..... 7
  - Hind femur without tooth ..... 10
- 7 Hind coxa dorsally thickly pilose in basal half ..... *T. cupreus* (Spinola)
  - Hind coxa bare ..... 8
- 8 PM 3.3-3.8 ST. Frenum 0.4-0.45 times length of scutellum. Body green and hind femur with a strong tooth ..... *T. armatus* Boheman
  - PM about 2.0 ST. Frenum 0.3 times length of scutellum; if green, than at most a very weak tooth on hind femora ..... 9
- 9 Body green with bronzy reflections, legs dark Tooth on hind femur weak, less than 0.25 breadth of femur ..... *T. fastuosus* Boheman
  - Mesosoma and propodeum blue, gaster fiery red, legs excluding sometimes fore and mid femora reddish. Hind femur with a strong tooth which is at least 0.5

- breadth of femur ..... *calcaratus* Nees
- 10 OOL not greater than OD; head (fig. 78) 2.25-2.35 as broad as long; temples converging very strongly. Scutellar frenum wholly smooth; rest of scutellum smooth between the punctures. Propodeum with a few longitudinal strigulae in its middle part ..... 11
- Either OOL distinctly greater than OD, or head less transverse; or scutellar frenum at least partly alutaceous and rest of scutellum reticulate between the punctures ..... 12
- 11 Length of pedicellus plus flagellum about 1.27 breadth of head ..... ?*T. macrurus* (Foerster)
- Length of pedicellus plus flagellum 1.15-1.18 breadth of head ..... *T. cyaneus* (Walker)
- 12 Vertex (fig. 13) with a suture connecting each lateral ocellus with the eye. Hind coxa dorsally with a few setae in basal half ..... *T. affinis* (Fonscolombe)
- Vertex without such a suture. Hind coxa dorsally bare in basal half ..... 13
- 13 Head in dorsal view only 1.7-1.9 times as broad as long. Hind coxa without a dorsal carina, except sometimes at base ..... 14
- Head at least twice as broad as long. Hind coxa sometimes with a dorsal carina .... 15
- 14 Antennal anellus as long as broad ..... *T. varians* (Walker)
- Antennal anellus slightly broader than long ..... *T. druparum* Boheman
- 15 Forewing with M 11-17 times as long as ST, the latter sessile (see fig. 38). Mesoscutum and (especially) scutellum with sparser, widely spaced punctures; a longitudinal median band on scutellum virtually impunctate ..... *T. baudysi* (Boucek)
- Forewing with M at most 9 times as long as ST, the latter at least slightly petiolate (*T. aucupariae*) or very distinctly so (other species). Mesoscutum and scutellum (apart from frenum) with numerous, closely arranged piliferous punctures ..... 16
- 16 Propodeum with about median third smooth or nearly so. Legs paler, femora hardly infuscate ..... *T. aucupariae* Rodzianko
- Median third of propodeum with at least some longitudinal striae on each side of the median line (see fig. 164 [of ♀ *notatus*]). Legs darker, all femora mainly black, tibiae usually more or less infuscate ..... 17
- 17 Hind coxa without a dorsal carina. Mesoscutum, and anterior part of scutellum, with very numerous and distinct, moderate-sized piliferous punctures. Hind femur often with a minute pre-apical tooth ..... *T. fastuosus* Boheman
- Hind coxa with a dorsal carina. Mesoscutum and anterior part of scutellum, with less numerous and less distinct piliferous punctures. Hind femur without a tooth ..... *T. notatus* (Walker) and *T. cerri* Mayr
- 18 Legs short, with greatly swollen femora; fore femora as stout as hind femora and only about 2.5 times as long as broad; mid tibia without apical spur ..... *T. hylesini* Graham
- Legs with femora rarely as stout as the above, if approaching this condition (*T. microcerus*, *caudatus*, *juniperi*) mid tibia with apical spur (as in all the species which follow) ..... 19
- 19 Head (fig. 126) with frons projecting on either side in front of eyes; frons with a shallow depression on each side; vertex with several rather large and close punc-

- tures within the ocellar triangle. Propodeum long (fig. 125) with strong, raised reticulation and some wrinkles, sometimes a median carina; mesosoma more than twice as long as broad. Dorsal surface of hind coxa with some setae in basal half. Legs, except coxae, reddish testaceous ..... *T. igniceps* Mayr
- Head with frons not so projecting, and without depression; ocellar triangle often not punctate. Either the propodeum is shorter, with weak reticulation or partly smooth; or the dorsal surface of the hind coxa is bare in the basal half; or the femora (and sometimes the tibiae) are partly to mainly black ..... 20
  - 20 Hind coxa with some setae dorsally in basal half. Propodeum distinctly reticulate, in larger specimens at least with two or more longitudinal striae, or traces of rugosity. POL 0.9-1.4 times OOL, lateral ocelli very small. Scutellum pointed at base. Upper posterior part of mesepimeron coppery or fiery ..... 21
    - Hind coxa often bare dorsally in basal half but if with some setae then propodeum weakly reticulate or even partly smooth. POL:OOL ratio usually greater than 1.4. Scutellum rounded at base. Mesepimeron with posterior upper part not coppery or fiery ..... 22  - 21 POL 0.9-1.0 times OOL. Funicular segments relatively longer, F1 1.5-1.75 times as long as pedicellus, F7 slightly longer than broad ..... *T. austriacus* Graham
    - POL 1.15-1.4 times OOL. Funicular segments relatively shorter, F1 at most slightly longer than pedicellus, F7 quadrate or subquadrate ..... *T. imperatrix* spec. nov.  - 22 Antennal scape (fig. 204) curved and clavate, broadening obviously in upper half, nearly four times as long as broad, reaching level of vertex. [Hind coxa dorsally bare in basal half. Propodeum with some irregular raised reticulation and wrinkles. OOL about 1.7 times OD] ..... *T. scaposus* Thomson
    - Antennal scape cylindrical or nearly so, relatively shorter, sometimes not reaching level of vertex ..... 23  - 23 Legs, except sometimes hind coxae, femora and tibiae, yellow. Pleuron of mesosoma usually more or less yellow. Mesoscutum and scutellum matt, with extremely fine and dense reticulation; piliferous punctures minute and almost invisible. Forewing: ST often enclosed in a fuscous cloud ..... *T. flavovariegatus* Gijswijt
    - Legs usually darker, if not then pleuron of mesosoma not pale marked. Mesoscutum and scutellum at least slightly shiny, with visible punctures. Forewing: ST without dusky cloud ..... 24  - 24 Forewing (see fig. 28): lower surface with a double or triple row of setae below cubital vein. [Mesoscutum and scutellum with relatively sparse and small, widely separated piliferous punctures] ..... *T. arundinis* (Walker)
    - Forewing: lower surface with one row of setae, or none, below cubital vein ..... 25  - 25 Dorsal surface of hind coxa bare ..... 26
    - Dorsal surface of hind coxa with some setae in basal half (a few doubtful cases are included in both sections of the key) ..... 54  - 26 Spurs of hind tibia weak, the shorter spur only 0.5 times length of longer one, the length of which is less than the breadth of the tibia. Antennal flagellum more or less testaceous beneath. [Fore and mid femora swollen; hind basitarsus short, only 3-3.5 times as long as broad] ..... *T. microcerus* (Walker)
    - Spurs of hind tibia normal, the shorter spur more than 0.5 times length of the



- longer one. Antennal flagellum normally black ..... 27
- 27 Length of longer spur of hind tibia 1.3-1.5 times breadth of tibia and twice as long as the stouter spur, fully 0.5 times length of basitarsus. Lateral ocelli moderately large: OOL 0.9-1.1 times OD. Antennal scape more or less yellow. [Hind coxa bare dorsally in basal half] ..... 28
- Length of longer spur of hind tibia at most about equal to breadth of tibia, at least slightly less than twice as long as the shorter spur. Lateral ocelli sometimes smaller. Antennal scape often black, occasionally more or less yellow ..... 29
- 28 Fore and hind femora slender, 4.0-4.7 times as long as broad. Mesosoma slender, in dorsal view 1.9-2.0 times as long as broad. Gaster at least reddish to yellowish ventrally in basal half, usually also with a median transverse band of the same colour dorsally. Legs, including fore coxae more or less yellow, occasionally more or less infuscate ..... *T. longicalcar* Graham
- Fore and mid femora stouter, 3.0-3.6 times as long as broad. Mesosoma more squat, 1.65-1.8 times as long as broad. Gaster black with metallic tints, usually without any pale marking, occasionally obscurely reddish at base ventrally. Legs coloured as in *T. longicalcar*, or with coxae and hind femora, and hind tibiae more or less infuscate ..... *T. flavipes* (Walker)
- 29 Gaster with distinct reddish-testaceous ring or band just before middle (very rarely only visible ventrally). Mesosoma (and often head) dark to bright blue, or violet. Antennae with proximal funicle segments not, or only slightly, longer than broad. [Mesepimeron not or hardly higher than broad] ..... 30
- If the gaster has a distinct pale ring, band or spot, or an indication of one, (some *T. ventralis*, *cingulatus*, *angelicae*) then the mesosoma is greenish, bronze green or partly purple and the proximal segments of the funicle are sometimes much longer than broad. (*T. phillyreae*, *filipendulae*) ..... 31
- 30 Antennal scape approximately equal in length to eye, reaching slightly above level of vertex. Malar space 0.40-0.48 times length of eye ..... *T. roboris* (Walker)
- Antennal scape shorter than length of eye, not reaching above vertex. Malar space 0.35-0.36 times length of eye ..... *T. nobilis* Boheman
- 31 Antennal scape reaching slightly to distinctly above vertex. Mesosoma often purplish or coppery dorsally; posterior half of gaster violet or purplish-black. Gaster with at least a rather obscure reddish antemedian band, sometimes visible only in profile view, sometimes mainly reddish-testaceous in basal half ventrally, and with a reddish-testaceous narrow to broad ring dorsally before middle ..... *T. erucarum* (Schrank)
- Antennal scape not reaching level of vertex. Mesosoma usually differently coloured, if partly purplish or coppery (*T. formosus*, some *scutellaris*) then gaster without pale band, posterior part usually differently coloured ..... 32
- 32 Gaster more or less testaceous at least ventrally over proximal half, sometimes also with dorsal ring before middle. Antennal funicle with segments quadrate or distal ones very slightly transverse. F1 not or hardly longer than pedicellus. Mesosoma bright green to blue ..... 33
- If gaster is determinately testaceous in proximal part, then antennal funicle has proximal segments longer than broad, F1 much longer than pedicellus. Mesosoma dull greenish or partly bronze (some *phillyreae*) ..... 34

- 33 Spurs of hind tibia virtually equal in length ..... *T. cingulatus* Nees  
 Spurs of hind tibia unequal ..... *T. angelicae* (Walker)
- 34 Mesepimeron as long as mid coxa, nearly circular, violet. Mesoscutum and scutellum with moderate-sized, very numerous and closely arranged piliferous punctures ..... *T. formosus* (Walker)
- Mesepimeron usually smaller, if nearly as large (*T. basalis*) then greenish, mesoscutum and scutellum with minute, more widely spaced piliferous punctures ..... 35
- 35 Mesoscutum and scutellum with moderate sized, very numerous and close piliferous punctures. Propodeum shiny, nearly smooth. Vertex between lateral ocelli and eyes, with only minute, hardly visible punctures. POL 1.5-1.7 times OOL .....  
 ..... *T. scutellaris* (Walker)
- Either mesoscutum and scutellum with small or very small punctures, which are usually less numerous and less close together; or propodeum distinctly reticulate; vertex between lateral ocelli and eyes, with a number of close, moderate sized punctures ..... 36
- 36 POL 1.9-2.0 times OOL ..... 37
- POL 1.3-1.75 times OOL ..... 42
- 37 Proximal segments of funicle much longer than broad, F1 1.5-2.0 times length of pedicellus. Head in dorsal view with temple only 0.15-0.28 times length of eye. [Species associated with *Fagus*] ..... 38
- Proximal segments of funicle not, or only slightly, longer than broad, F1 at most only 1.2 times length of pedicellus. Temple 0.25-0.29 times length of eye and less strongly convergent ..... 39
- 38 Antennal scape 0.57-0.65 times length of eye, not reaching anterior ocellus. Gaster more or less testaceous basally ..... *T. fagineus* Graham
- Antennal scape 0.68-0.73 times length of eye, reaching level of middle of anterior ocellus, or nearly to level of vertex. Gaster dark, or at most with a rather obscure pale subbasal spot ventrally ..... *T. speciosus* Boheman
- 39 Pedicellus plus flagellum 1.5-1.6 times breadth of head; proximal funicle segments usually slightly longer than broad, F1 slightly to distinctly longer than pedicellus. Hind femur 4.5-4.7 times as long as broad. Mesonotum and scutellum with small punctures, most of which are separated by nearly twice their diameter. Legs, including fore coxae more or less, reddish-testaceous ..... *T. hederiae* (Walker)
- Either length pedicellus plus flagellum is at most 1.4 breadth of head; or hind femur (*T. phillyreae*) at most 3.75 times as long as broad ..... 40
- 40 Pedicellus plus flagellum about 1.5 times breadth of head. Scape yellowish at base and often partly beneath. Fore coxae yellow except sometimes at base. Gaster at least with obscure reddish or testaceous subbasal ventral spot, sometimes with distinct yellow ring which extends on to dorsal surface. Setae on mesoscutum very short, nearly decumbent (fig. 173) .....  
 ..... *T. phillyreae* Ruschka and *T. canariensis* Hedqvist
- Pedicellus plus flagellum 1.3-1.35 breadth of head except in *quercinus*, which has scape dark, fore coxae black, gaster black. Setae of mesoscutum longer and slightly raised ..... 41
- 41 Mesepimeron about circular, nearly as high as mid coxa. F1 not shorter than F2, with sensilla, dull. Femora infusate ..... *T. basalis* (Walker)

- Mesepimeron smaller and at least slightly higher than broad. Antennae (fig. 86) with F1 slightly to distinctly shorter than F2, without sensilla or with F1. shiny. All femora mainly dark ..... *T. eglanteriae* Mayr
- 42 Hind coxa 3 times as long as broad, its hind edge not curved, except in basal 0.25. Very small species, length at most 1.5 mm. Flagellum with somewhat outstanding curved setae. [Head in dorsal view (fig. 95) 1.8-1.85 times as broad as long; vertex dull purplish] ..... *T. filipendulae* spec. nov.
- Hind coxa usually less than three times as long as broad, its hind margin more distinctly curved; or if (*T. novitzkyi*) approaching the above, then vertex blue-green. Species often relatively larger, if as small as above, then vertex not purplish, flagellum with subdecumbent setae ..... 43
- 43 Hind coxa nearly three times as long as broad, its hind margin nearly straight, curved only in basal 0.25. Mesoscutum and scutellum shiny, without punctures, the setae arising from minute warts. [POL 1.5 times OOL] .... *T. novitzkyi* Graham
- Hind coxa at most about 2.5 times as long as broad, with hind margin distinctly curved. Mesoscutum with setae arising from at least very small punctures ..... 44
- 44 Very small species: 1.2 mm. Head 1.85 times as broad as long. Antennae with F1 shorter than pedicellus and slightly shorter than F2, shiny and apparently without sensilla. Longest spur of hind tibia about 0.55 times as long as basi tarsus. [POL about 1.7 times OOL] ..... *T. ramicola* Ruschka
- Either larger; or head at least twice as broad as long. Antennae: F1 with at least 1 sensillum and usually not shorter than F2 ..... 45
- 45 Mesoscutum and scutellum with minute punctures, those of scutellum widely spaced. Posterior 0.25 of scutellum very shiny. Genae in front view of head slightly curved. Body blue-green to greenish-blue, also scape and femora. On *Populus tremula* ..... *T. quercinus* Boheman
- Either mesoscutum and scutellum with more distinct punctures and posterior part of scutellum not more shiny than the rest, or genae straight ..... 46
- 46 Vertex between lateral ocelli and eye, also ocellar triangle, with several distinct punctures. Antenna with F1 (except in a few dwarfs) as long as or somewhat longer than pedicellus, 1.2-1.5 times as long as broad. Propodeum usually with distinct sculpture which tends to radiating striae, sometimes with rugosity or wrinkles (but obsolescent in dwarfs). PM less than twice ST ..... 47
- Vertex with punctures minute and generally not well visible amongst the reticulation, if rather more distinct than F1 slightly shorter than pedicellus and propodeum (as in all this group) weakly alutaceous. PM twice as long as ST ..... 51
- 47 Punctures on mesoscutum very numerous, those of anterior half of scutellum moderately so. Legs, except coxae, nearly wholly red [scape slightly shorter than eye breadth, hardly reaching anterior ocellus. Vertex duller and more distinctly reticulate than in *ventralis*] ..... ?aberrant *ventralis*
- Punctures of mesoscutum less numerous, or legs darker ..... 48
- 48 Head and mesosoma dark blue to violet; gaster fiery or coppery-green with base bright green to blue. Forewing usually with a distal cloud, which is sometimes strong. [Legs, except coxae, red, rarely femora somewhat infusate. Frons 1.17-1.27 times length of eye; anellus very slightly transverse. Scape reaching at most to lower edge of anterior ocellus, 3.5-4.5 times as long as broad, its length hardly

- greater than transverse diameter of eye] ..... *T. regalis* (Walker)
- Head end mesosoma bronze-green, green or blue; gaster with posterior half usually violet or purplish-bronze, occasionally greenish. Forewing usually without discal cloud ..... 49
- 49 Eyes with short but distinct setae, easily visible  $\times 50$  (see fig. 60 of ♀). Antennal scape reaching at most to level of lower edge of anterior ocellus, anellus nearly quadrate ..... *T. chrysocephalus* Boheman
- Eyes with very short setae, hardly visible  $\times 50$ . Either antennal scape reaching above lower edge of anterior ocellus, or anellus is broader than long ..... 50
- 50 Legs, apart from coxae, reddish-testaceous. Antennal scape reaching to level of middle, or top, of anterior ocellus, 3.6-4.2 times as long as broad. Anellus quadrate. Frons 1.17-1.28 times length of eye ..... *T. laetus* (Walker)
- Legs with hind femora mainly to wholly black, mid and fore femora at least partly fuscous, hind tibiae more or less infusate. Antennal scape reaching at most to level of lower edge of anterior ocellus, 3.0-3.8 times as long as broad. Anellus broader than long ..... *T. ventralis* (Fonscolombe)
- 51 Mouth 2.2-2.35 times as long as malar space. Mesosoma rather stout, as broad as head. Hosts: *Rabdophaga salicis* and *R. saliciperda* on *Salix* .....  
 ..... *T. tipulariarum* (Zetterstedt)
- Mouth 1.9-2.0 malar space. mesosoma more slender, narrower than head ..... 52
- 52 Antennal scape (fig. 75) slightly expanded medially. Fore and mid femora more or less infusate, hind femora mainly black. Host unknown . *T. curticauda* spec. nov. Antennal scape narrower medially, with a projecting bump at base. Legs sometimes relatively paler. Species associated with *Salix* ..... 53
- 53 Malar space 0.3-0.38 times length of eye. Fore and mid femora testaceous; tibiae testaceous or at most the hind tibiae slightly infusate ..... *T. amurensis* (Walker)
- Malar space 0.4-0.43 times length of eye. Fore and mid femora more or less infusate, hind femora mainly black; hind tibiae, or all tibiae infusate ..... sp. indet.
- 54 Mouth 1.55-1.6 times as long as malar space. Gena very long, 0.47-0.5 times length of eye. Anellus 1.5-1.6 times as long as broad ..... *T. cupratus* Boheman
- Mouth more than 1.75 malar space. Gena at most 0.4 times length of eye. Anellus quadrate or slightly transverse ..... 55
- 55 Forewing almost wholly pilose, without a speculum or with only a very narrow line immediately beyond basal vein; basal cell usually pilose. Head (fig. 19) 1.8-1.85 times as broad as long; temples fully half as long as eyes, rounded. Body mainly bronze black; legs mainly black with only tarsi partly pale, knees and tips of tibiae somewhat obscurely pale ..... *T. apiomyiae* Boucek & Mihajlovic
- Forewing with at least a small but distinct speculum, often also basal cell more or less bare. The other characters not present in combination ..... 56
- 56 Legs almost wholly black, only hind tarsi more or less pale at base. [Basal cell of forewing extensively pilose] ..... *T. nigratarsus* (Walker)
- Legs never so extensively dark. Basal cell of forewing more or less pilose or bare ..  
 ..... 57
- 57 Basal cell mainly to wholly pilose; speculum closed or nearly closed below. Hind basitarsus short, 3.5-4.75 times as long as broad. Fore and hind femora moderately swollen ..... 58

- Basal cell with at most a few setae; speculum at least partly open. Hind basitarsus of normal length. Femora not swollen ..... 60
- 58 Pleuron usually more or less yellow; gaster with testaceous basal part at least ventrally. [Mesoscutum and scutellum matt] ..... *T. flavovariegatus* Gijswijt
- Species without yellow markings ..... 59
- 59 Length of longer spur of hind tibia less than breadth of tibia. Malar space 0.35-0.36 times length of eye. Forewing with at least upper half of basal cell pilose. All femora black with at most tips narrowly pale; tibiae usually strongly infuscate .....  
..... *T. juniperi* (L.)
- Length of longer spur of hind tibia about equal to breadth of tibia. Malar space about 0.27 times length of eye. Forewing less extensively pilose. Fore and mid femora often extensively testaceous ..... *T. caudatus* Boheman
- 60 Mesoscutum and scutellum with distinct, numerous punctures which are relatively close. Antennal scape often more or less testaceous at base ..... 61
- Mesoscutum and scutellum with smaller or very small and/or more remote punctures (*T. stenus*). Antennal scape rarely testaceous at base ..... 65
- 61 Pedicellus plus flagellum 1.3-1.45 times breadth of head; F1-F3, or all funicle segments, quadrate. Posterior 0.4-0.6 of gaster fiery or reddish-purple. [Malar space 0.3-0.35 times as long as length of eye] ..... *T. bedeguaris* (L.)
- Pedicellus plus flagellum 1.17-1.3 times breadth of head; except in some *T. rubi* (which has the posterior part of gaster greenish), only F1 quadrate, rest at least very slightly transverse. Posterior part of gaster not fiery ..... 62
- 62 Malar space 0.38 times length of eye. Body blue-green to blue; all femora mainly black. F3 and following segments very slightly transverse, scape black. Small species: 1.5-1.6 mm ..... *T. thymi* Ruschka
- Malar space 0.27-0.38 times length of eye. Larger species. Other characters various. .... 63
- 63 Posterior half of gaster greenish or bronzy. At least F1-F3 quadrate. Ocellar triangle closely and distinctly punctate ..... *T. rubi* Schrank
- Posterior 0.25-0.66 of gaster purplish-bronze or purplish. Only F1 quadrate, rest very slightly transverse. Ocellar triangle with punctures minute and mixed with reticulation ..... 64
- 64 Fore and mid femora yellow, sometimes dark below. Hind tibiae yellow or slightly infuscate medially ..... *T. auratus* (Müller)
- Fore and mid femora infuscate in basal 0.6 or more. Hind tibiae usually broadly infuscate medially ..... *T. geranii* (Walker)
- 65 Antennal scape broadest in lower half and yellowish at base and often beneath. Fore coxae yellow except sometimes at base. Setae on mesoscutum very short, nearly decumbent (fig. 173). Gaster ventrally near base with an obscure testaceous spot, or with a distinct yellow ring..... see *T. phillyreae* (couplet 40)
- Antennal scape not broadest in lower half, usually black, rarely distinctly pale at base. Fore coxae most often dark. Setae on mesoscutum longer and at least slightly raised. Gaster normally dark ..... 66
- 66 Head only 1.85-1.95 as broad as long. Pedicellus plus flagellum 1.43-1.5 times breadth of head. Genae distinctly curved ..... *T. aceris* Bouček
- Head usually 2.0-2.15 times as broad as long, or, if less (*T. narvikensis*) then pedi-

	cellus plus flagellum about 1.1 times head. Genae usually straight, occasionally slightly curved. Length pedicellus plus flagellum often less .....	67
67	Mesosoma elongate, 2.15-2.2 times as long as broad. Scutellum 1.4-1.5 times as long as broad .....	<i>T. stenus</i> Graham
-	Mesosoma less elongate, at most twice as long as broad. Scutellum less elongate ... ..	68

NOTE: The following species are very difficult to distinguish.

68	Pedicellus plus flagellum (1.45-)1.5-1.6 times breadth of head. F1 slightly to distinctly longer than pedicellus (not in dwarf <i>chloromerus</i> ) .....	69
-	Pedicellus plus flagellum 1.05-1.4 times breadth of head. F1 usually shorter or equal to pedicellus, sometimes very slightly longer .....	71
69	Mouth 1.87-2.1 malar space. Temple 0.22-0.28 times apparent length of eye. Body length 1.9-3.2 mm .....	<i>T. chloromerus</i> (Walker) and <i>T. persicariae</i>
-	Mouth 2.23-2.3 times malar space. Temples 0.34-0.35 apparent length of eye. Body length 1.5-2.6 mm .....	70
70	On <i>Salix</i> . Length about 2.6 mm .....	<i>T. impar</i> (Rondani)
-	On Umbelliferae. Length 1.5-2.4 mm .....	<i>T. curtisi</i> nom. nov.
71	Outer surface of antennal scape with base and front edge smooth and shiny; funicle segments quadrate in larger specimens, transverse in small ones (1.5-1.7 mm) . ..	<i>T. confinis</i> (Walker)
-	Outer surface of antennal scape, except at extreme base, with minute reticulation; even in small specimens the proximal segments tend to be quadrate .....	72
72	Antennal flagellum short and notably stout; distal segments of funicle distinctly transverse. Very small species, about 1.5 mm, with dark legs .....	<i>T. millefolii</i>
-	<u>Either</u> flagellum less stout; <u>or</u> distal funicle segments quadrate or hardly transverse; <u>or</u> size greater .....	73
73	Very small species: 1.3-1.4 mm. Pedicellus plus flagellum about 1.1 times breadth of head; funicle segments quadrate or F7 very slightly transverse. Legs relatively pale .....	<i>T. artemisiae</i> Mayr
-	Length 1.5-2.0 mm. Pedicellus plus flagellum 1.2-1.4 breadth of head; distal funicle segments sometimes slightly transverse; legs dark or pale .....	69
74	Temples about 0.4 times apparent length of eyes .....	<i>T. janetiellae</i> spec. nov.
-	Temples 0.25-0.35 apparent length of eyes .....	75
75	Temples about 0.25 apparent length of eyes. Genae very slightly curved. Fore coxae sometimes more or less yellow .....	<i>T. cultriventris</i> Ratzeburg [also some <i>T. chloromerus</i> , with genae straight]
-	Temples 0.3-0.35 times length of eyes. Genae straight or virtually so. Fore coxae usually black (but more or less yellow in some <i>T. orobi</i> ) .....	76
76	F1 slightly to distinctly longer than pedicellus .....	<i>T. microstigma</i> (Walker)
-	F1 not longer than pedicellus .....	77
77	Fore coxae partly yellow. Mouth 1.95 times malar space, malar space 0.36 times as long as eye .....	<i>T. orobi</i> Mayr
-	Fore coxae black. Mouth 2.1-2.2 times malar space .....	78
78	Eyes separated by 1.2-1.25 their length. Funicle segments quadrate, F1 as long as	

F2 .....	<i>T. anthobiae</i> Ruschka
- Eyes separated by 1.1-1.12 their length .....	79
79 On <i>Salix</i> . Hind coxa with at most two setae dorsally in basal half . see <i>T. amurensis</i> (couplet 53)	
- On other plants. Hind coxa with five or more setae dorsally in basal half .....	80
80 OOL 1.10-1.15 times OD. F1 in large specimens (1.8 mm) at least slightly, in dwarfs of 1 mm length much, shorter than F2 .....	<i>T. corni</i> Mayr
- OOL 1.25-1.5 times OD. F1 not or hardly shorter than F2 .....	81
81 F1 slightly longer than broad. Host on <i>Filipendula</i> .....	<i>T. ulmariae</i> Ruschka
- F1 not longer than broad. Host on other plants .....	82
82 On <i>Galium</i> spp. ....	<i>T. galii</i> Boheman
- On <i>Tanacetum</i> .....	<i>T. tanaceticola</i> Ruschka.

### Synonymy, biology, distribution and descriptions of the species

#### *Torymus aceris* Boucek, 1994 (figs 11-12)

*Torymus aceris* Boucek, 1994: 69-71; Grissell, 1995:274.

Type material.— **Holotype**, ♀, (NMP): Czech Republic: “Praha-Motol, ex seeds *Acer campestre*, i.1969 (Strejcek)”. **Paratypes**: 63 ♀♀ 54 ♂♂, (BMNH) topotypic, reared in January and February 1969), including one ♀ from seed of *Acer pseudoplatanus*; 1 ♀ (OUM) from seeds of *A. campestre*; Great Britain, Berkshire: “Bagley Wood, from seed of *Acer campestre*, 22.iv.1942, E.W. Jones”; 1 ♀ (BMNH), Cambridgeshire, “Overhall Grove, ex dipterous larva in seeds of *A. campestre* coll. 2.i.1986, I.O.S. Brodie”; 1 ♀ (BMNH), Hampshire; “Ampfield, Hillier’s arboretum, seed *A. campestre*, em. 12.ix.1978, T.G. Winter”.

**Biology**.— Reared from *Megaselia* sp.(Dipt. Phoridae) in seeds of *Acer* spp.

**Distribution**.— Czech Republic, France, Great Britain.

#### *Torymus affinis* (Fonscolombe, 1832) (fig. 13, 239)

[*Callimome affinis* Stephens, 1829: 119 (nomen nudum)].

*Cinips affinis* Fonscolombe, 1832: 283-284, ♀; Graham, 1992b: 1098.

*Callimome affinis*; Walker, 1833: 133-134, ♂ ♀.

*Torymus affinis*; Boucek, 1977: 24; Boucek & Graham, 1978a: 226; Grissell, 1995: 274.

*Syntomaspis affinis*; Sellenschlo & Wall, 1984: 20.

*Callimome apicalis* Walker, 1833: 133, ♂.

*Syntomaspis apicalis*; Eady, 1959: 259; Nikol’skaya & Zerova, 1978: 368-369; Sellenschlo: 1984: 460.

*Callimome littoralis* Walker, 1833: 134, ♀.

*Callimome littorale*; Hoffmeyer, 1930c: 245.

*Callimome tarsalis* Walker, 1833: 134, ♀.

*Callimome fuscipennis* Walker, 1833: 137, ♂.

*Torymus saphirinus* Boheman, 1834: 371, ♂ ♀.

*Syntomaspis saphirina*; Thomson, 1876: 75.

*Torymus caudatus* Nees, 1834: 60, ♂ ♀.

*Syntomaspis caudata*; Mayr, 1874: 75.

*Torymus viridissimus* var. a Zetterstedt, 1838: 420, (ex parte), (nec *T. viridissimus* Boheman, 1834).

*Torymus admirabilis* Foerster, 1840: xxx, ♀.

*Torymus crinicaudis* Ratzeburg, 1844: 179, ♂ ♀.

Type material.— *Callimome affinis* Walker: as originally cited (Stephens, 1830) this was a nomen nudum. In 1833 Walker attributed the name to Fonscolombe. Eady (1959: 259) designated a lectotype, which is invalid.

*Cinips affinis* Fonscolombe: **neotype**, (BMNH): designated by Graham (1992: 1098).

*Callimome apicalis* Walker: **lectotype**, (MBNH): designated by Eady (1959: 259).

*Callimome littoralis* Walker: Eady (1959: 260) found no material in BMNH. Graham discovered one female, labelled "In BM. 1952, under *Torymus incertus* Först." in Eady 's hand. This agrees with the description of *Callimome littoralis* Walker but it is unlikely to be a syntype.

*Callimome tarsalis* Walker: Eady (1959: 268) found no material; he assumed it to be the same as *quercinus* Boheman 1834, with which it had been synonymised by Walker (1846: 17). Graham found a female specimen standing under *quercinus* and so labelled, in BMNH; it agrees with the description, and is here designated **lectotype** of *Callimome tarsalis* Walker (BMNH). *C. tarsalis* Walker was placed in synonymy with *T. affinis* (Fonsc.) by Boucek & Graham (1978: 226).

*Callimome fuscipennis* Walker: a **lectotype**, (BMNH), was designated by Eady (1959: 260).

*Torymus saphirinus* Boheman: there are five male and five female syntypes under this name in Boheman's collection (NR), conspecific with *affinis* (Fonscolombe). Of the five females, four have the wrong locality. The female, labelled "Sm" [Småland] agrees with the description and is here designated **lectotype**.

*Torymus caudatus* Nees: original material destroyed. The description support that that it was the same as *affinis*, with which it was synonymised by Boucek & Graham (1978: 226).

*Torymus viridissimus* Zetterstedt: in the Zetterstedt collection (ZIL) stands a ♀ which is labelled "*T. viridissimus* ♀ a". It agrees with the description of *viridissimus*; for details see under comments.

*T. admirabilis* Foerster: no original material located.

*T. crinicaudis* Ratzeburg: original material presumed lost.

Comments.— *Torymus viridissimus*: Zetterstedt (1838: 420) gave a short diagnosis of this species, which includes the phrase "scapo discolore"; followed by descriptions of two forms, var. a and var. b (the latter "*T. tipulariarum* "). Under var. a. he mentioned "Scan. [Skåne] in Carduo lanceolato, etiam e gemmis imbricatis Quercus egressus; passim". His material from *Carduus* and from *Quercus* must have represented two different species. The description of var. a. includes the phrases "antennis nigris scapo aeneo .... cauda corpore duplo longiore ...." and "pedibus viridibus, tibiis infuscatis, geniculus tarsisque pallidis ...". We do not know any species from *Carduus* which fits this description but as regards species from *Quercus* galls, *Torymus affinis* (Fonscolombe) fits very well. In Zetterstedt's collection (ZIL) Graham found a female labelled "*T. viridissimus* ♀ a". It has previously been labelled as *Syntomaspis littoralis* (Walker) by C. Ferrière. As the term "var. a" does not have status in nomenclature, it is not necessary to designate type material. Zetterstedt's species is different from *viridissimus* Boheman (1834:358-359) of which no material has been found in Boheman's collection. Thomson (1876: 75) recognised Boheman's species, his material being referable to *T. auratus* (Müller).

*Torymus admirabilis* Foerster: Ratzeburg (1844: 181) stated that he had seen the holotype; from his redescription, and the host (*Biorhiza pallida*) it was clearly *affinis*.

*Torymus crinicaudis* Ratzeburg: Ratzeburg (1848: 181) placed his species in synonymy with *admirabilis* Foerster.



Diagnostic notes.— The relative length of the ovipositor varies considerably. From a gall of *Biorhiza pallida* collected in France (Bouches du Rhône, Fonscolombe) by Mrs. E.M. Graham, a female *affinis* emerged on 2.iii.81, which has the ovipositor hardly as long as the body, although other females reared the same day have the ovipositor much longer than the body, as usual.

Morphological characters of larvae have been described by Sellenschlo (1984a: 460, as *Syntomaspis apicalis* (Walker)).

Biology.— A parasite in galls of *Biorhiza pallida* (Olivier) (Hym. Cynipoidea).

Distribution.— A common species in Europe.

*Torymus amurensis* (Walker, 1874)  
(figs 14-15)

*Callimome Amurensis* Walker, 1874a: 312, ♀.

*Torymus amurensis*; Boucek & Graham, 1978a: 226 Grissell, 1995: 275.

*Torymus* sp. ? near *schiodtei* (Hoffmeyer) Graham, 1969: 67-68, ♀.

Type material.— **Lectotype**, ♀, (BMNH), here designated, the female registered in BMNH as Type Hym. 5. 28; it is labelled in Walker's hand "Amurensis".

Biology.— Associated with Tenthredinidae on *Salix*..

Distribution.— Austria, Czech Republic, France, Great Britain, Ireland, Netherlands, Russia: East Siberia (Amurland), Slovakia.

*Torymus angelicae* (Walker, 1836)  
(fig. 240)

*Torymus abdominalis* Boheman, 1834: 343-344, ♀ (secondary homonym of *Torymus* [*Callimome*] *abdominalis* (Walker, 1833); Thomson, 1876: 93.

*Callimome geranii* Curtis, 1835: 552 (misidentification of *Callimome geranii* Walker, 1834).

*Callimome Angelicae* Walker, 1836: 25-26, ♀.

*Torymus angelicae*; Eady, 1959: 265.

[*Torymus cingulatus*; Graham, 1969: 66 (ex parte). Misidentification].

Type material.— **Lectotype** of *Torymus abdominalis* Boheman, ♀ (NR): labelled "Sm" [Småland] and "Bhn." [Boheman], here designated.

*Callimome angelicae* Walker: **lectotype**, ♀, (NMI) designated by Graham (1969: 66) It bears serial number 321, with a pink label "angelicae" in Haliday's hand.

Comments.— *Torymus abdominalis* Boh.: there are two females in NR from Småland. Four other specimens in Boheman's collection are not from the type locality.

*Callimome angelicae* Walker: there are five syntypes in the Haliday collection (NMI). Walker (1836: 25) queried whether *angelicae* might be the same as *abdominalis*.

Biology.— Unknown.

Distribution.— Great Britain, Ireland, Sweden.

*Torymus anthobiae* Ruschka, 1921  
(figs 17-18)

*Torymus anthobiae* Ruschka, 1921: 338, ♀; Grissell, 1995:275.

*Callimome anthobiae*; Hoffmeyer, 1930c: 244, ♀.

? *Torymus anthobiae*; Sellenschlo & Wall, 1984: 21.

Type material.— No original material could be located.

Comments.— The species is described from 2 females reared from *Contarinia anthobia* F. Loew, Wiedling, Lower Austria. Fresh material which agrees with Ruschka's description, has been reared from the above host by Mr. W. Nijveldt, Wageningen; our concept of *anthobiae* is based on this material.

Biology.— Reared from galls of *Contarinia anthobia* F. Loew (Dipt. Cecidomyiidae), on *Crataegus*.

Distribution.— Austria, Netherlands.

*Torymus apiomyiae* Boucek & Mihajlovic, 1986  
(fig. 19)

*Torymus apiomyiae* Boucek & Mihajlovic, 1986: 447-449, ♂, ♀; Grissell, 1995: 275.

Type material.— **Holotype**, ♀, (BMNH): Yugoslavia "Macedonia, Bistrica nr. Bitolj, 1.iv.1983, M. Postolovski". **Paratypes**: 33 ♀♀, 14 ♂♂ (BMNH, FFB): same origin as holotype, 1.iv.1983, 14 & 23.iii.1984, and 1985.

Biology.— Parasite of *Apiomyia bergenstammi* (Wachtl) (Dipt. Cecidomyiidae) on *Pirus*.

Distribution.— Macedonia.

*Torymus arcadius* spec. nov.

Type material.— **Holotype**, ♀, (RMNH) "Ellas Pelopon. prov. Lakonia M.J. Gijswijt; Kotronas 8 km E Areopoli 15.v.1989". **Paratypes**: (MJC, RMNH) 1 ♀ same data as holotype; 1 ♀ same locality but 14.v.1989; 1 ♀ "Ellas Pelopon prov. Lakonia M.J. Gijswijt, Himara 5 km E of Areopoli 14.v.1989"; 1 ♀ "Ellas Pelopon prov. Lakonia M.J. Gijswijt, Mani peninsula 9.v.1989"; 1 ♀ "Ellas Pelopon prov. Ahaia M.J. Gijswijt, Kalavrita 31.v.1989"; 1 ♀ "Ellas Pelopon prov. Ahaia M.J. Gijswijt, Pirgos, 4 km SW Akrata 8.vi.1989"; 1 ♀ "Ellas Pelopon prov. Argolida M.J. Gijswijt, Mikines 17.iv.1989"; 1 ♀ "Ellas Kriti M.J. Gijswijt, Knossos 30.iv.1978".

Description of female.— Morphology: head in dorsal view twice as broad as long, temples 0.25 apparent length of eye. POL 1.8-2.0 OOL, OOL 1.25-1.4 OD. Vertex with scattered very fine punctures. Frontally seen, the head is trapeziform with straight genae. Clypeus hardly produced, very shallowly emarginate. Mouth 1.8 length of malar space, the latter 0.31-0.36 length of eye. Antennae with toruli well above lower eyeline, but slightly nearer to clypeus than to anterior ocellus; scape 3.6 times as long as broad, not or just reaching lower edge of anterior ocellus; pedicellus plus flagellum 1.1-1.15 times as long as breadth of head, flagellum proximally slightly stouter than

pedicellus; pedicellus 1.5-1.6 times as long as broad; anellus slightly transverse; F1 subquadrate, F2-F5 quadrate, F6 and F7 slightly transverse in larger females, F1 and F2 quadrate, rest of funicle segments slightly transverse in smaller females; clava twice as long as broad; sensilla numerous, uniseriate.

Mesosoma 1.75 times as long as broad. Mesonotum 1.2 times as broad as long, punctures very numerous though minute, setae rather short, slightly raised. Scutellum 1.25 times as long as broad, sculptured as mesoscutum, with rounded subtruncate base, setae on hinder third long; flange narrow, distinctly trabeculate. Dorsellum nearly smooth, with a trace of a sulcus. Propodeum very finely delicately alutaceous, smoother medially. Mesepimeron 1.5 times as high as broad, distinctly shorter than mid coxa (23:30). Hind coxa 2.5 times as long as broad, its hind edge fairly strongly curved, with rather coarse raised reticulation, thickly hairy in basal half; spur of hind tibia 0.42 length of basitarsus. Forewing 2.4 times as long as broad; costal cell eight times as long as broad, above with one complete row, below with one complete row plus scattered setae in basal 0.25 and distal 0.3; basal cell with a row of 6-7 setae, closed; basal vein with 6-7 setae; speculum partly open, extending slightly beyond parastigma; M:PM:ST=36:11:5, stigma only slightly oblique, small.

Gaster slightly compressed, basal sternite projecting somewhat beyond coxa; hypopygium extending 3/4 along gaster, bare except tip. Ovipositor index 2.05-2.55, about as long as metasoma plus half mesosoma. Length 2.3-3.0 mm.

Colour: body bright green to blue-green or greenish-blue. Antennae black, scape testaceous beneath. Coxae, and hind femora except bases and tips, coloured like the body; fore and mid femora fuscous proximally; hind tibiae more or less broadly infuscate medially; legs otherwise testaceous, with last tarsal segments fuscous, segment 4 brownish. Tegulae testaceous with hind border and external edge fuscous. Wings hyaline, venation testaceous.

Male.— Unknown.

Comments.— In morphology *T. arcadius* is very close to *chloromerus* but differs as follows: the relative length of pedicellus plus flagellum is shorter (1.1-1.15, in *chloromerus* 1.25-1.45), and the flagellum is stouter. F1 is slightly to distinctly stouter than pedicellus (not or hardly in *chloromerus*); the funicle segments are at most quadrate, the distal ones even slightly transverse (in *chloromerus* F1-F3 are longer than broad), the ocelli are slightly smaller: OOL 1.25-1.4 OD (at most 1.25 in *chloromerus*).

Biology.— Unknown.

Distribution.— Greece.

*Torymus arcella* spec. nov.

Type material.— **Holotype**, ♀, (BMNH): "TURKEY: Kars. Ararat below Serdarbulak 4.iv.1969 5.000" "Guichard & Harvey B.M. 1960-364" "*Torymus arcella* spec. nov. M. de V. Graham det. & M.J. Gijswijt". **Paratypes**: 2 ♀, (BMNH): same data as holotype.

Description of female.— Morphology: head in dorsal view 2.15 times as broad as long, temples 0.18 length of eye, moderately convex, very slightly curved. POL 1.85-2.2 times OOL, OOL 1.35 OD. Vertex finely reticulate with several very small punctures. In frontal view face fairly thickly set with rather short, white setae. Mouth

about twice as long as malar space, the latter 0.3 times length of eye; genae straight. Clypeus slightly produced, curved. Antennal toruli distinctly above lower eyeline, but slightly nearer to clypeus than to anterior ocellus; scape nearly reaching ocellus; pedicellus plus flagellum 1.17 times as long as breadth of head, funicle proximally slightly stouter than pedicellus, slightly clavate; pedicellus nearly twice as long as broad; anellus 1.4 times as broad as long; all funicle segments quadrate except sometimes F7 which is may be slightly transverse; clava twice as long as broad; sensilla numerous, uniseriate.

Mesosoma 1.65 times as long as broad, strongly arched, notauli not deep. Mesoscutum 1.3 times as broad as long, finely reticulate slightly rippled in front; setae numerous but rather short; punctures numerous, minute. Scutellum about 1.2 times as long as broad, subtruncate to rounded at base, punctures as on mesoscutum; setae on hinder third longer than on frontal part; flange narrow but distinctly trabeculate; in the holotype its posterior margin has a row of long, backward-pointing setae. Dorsellum nearly smooth or weakly alutaceous. Propodeum very finely superficial alutaceous, smoother medially. Hind coxa 2.2 times as long as broad, hairy dorsally with a double row of setae. Spur of hind tibia 0.38 times length of basitarsus. Forewing 2.3 times as long as broad; costal cell bare on upper side, except in distal third for one row, underside with one, medially widely broken row, plus some scattered hairs basally and in distal half; basal vein with 2-4 hairs; basal cell nearly bare, closed; speculum mainly open, extending to slightly beyond parastigma. M:PM:ST=57:14:5; stigma sessile, very small, circular.

Gaster moderately compressed; basal sternite reaching only slightly beyond hind coxa; hypopygium reaching nearly level of apex of gaster, bare. Ovipositor sheaths about as long as metasoma plus mesosoma, index 3.0-3.25. Length 2.0-2.4 mm.

Colour: head and thorax bright green with some golden reflections. Toruli testaceous, scape yellow, pedicellus dark brown, flagellum slightly lighter brown. Palpi and tegulae yellow. Hind coxae and part of the mid coxae coloured as body, rest of the legs yellow, except last tarsal segments, which are brown. Gaster blue to violet. Wing veins testaceous.

Male.— Unknown.

Comments.— The female of *arcella* can be distinguished from the other species by the longer hypopygium in combination with the larger ovipositor index and the yellow legs.

Biology.— Unknown.

Distribution.— Turkey.

*Torymus arcticus* (Thomson, 1876)  
(figs 20-24)

[*Torymus cupratus* Boheman; Mayr, 1874: 75-76, ♀ (not ♂). Misidentification].

*Callimomus arcticus* Thomson, 1876: 80, ♂ ♀.

*Torymus arcticus*; Boucek, 1977: 24; Grissell, 1995: 275.

*Callimomus arcticus*; Hoffmeyer, 1930c: 235; Nikol'skaya & Zerova, 1978: 368; Sellenschlo & Wall, 1984: 19, in part (excluding records for Hungary and Yugoslavia).

Type material.— **Lectotype** of *Callimome arcticus*, ♀, (ZIL, type No. 1539.1): selected by Graham, vali-

dated by Hansson (1991: 10); labels "Lp. in."; "Bhn"; "arcticus m." [in Thomson's hand].

Comments.— There are three specimens, a ♀ and 2 ♂♂, in Thomson's collection, all from Swedish Lapland. The presence of this species elsewhere has not been confirmed. A record from Yugoslavia (Boucek, 1977: 24) is a misidentification; the specimen is referable to *imperatrix* spec. n.

Biology.— Unknown.

Distribution.— Sweden.

*Torymus argei* Boucek, 1994  
(fig. 25)

*Torymus argei* Boucek, 1994: 71-72, ♀; Grissell: 1995: 275.

Type material.— **Holotype**, ♀, (BMNH): Germany, Berlin district, ex *Arge "rosae/pagana"*, 1957 ("541-57-c-1") (Schwenke).

Biology.— Reared from *Arge ochropus* (Gmelin) or *A. pagana* (Panzer) (Hym., Symphyta, Argidae).

Distribution.— Germany.

*Torymus armatus* Boheman, 1834  
(fig. 26)

*Torymus armatus* Boheman, 1834: 336-338, ♂ ♀.

*Diomorus nobilis* Walker, 1834: 159, ♀.

*Diomorus armatus*; Mayr, 1874: 75; Thomson, 1876: 72; Hoffmeyer, 1930c: 254; Boucek, 1954: 59; 1977: 19; Nikol'skaya & Zerova, 1978: 368; Sellenschlo & Wall, 1984: 29; Graham, 1992a: 112, 113; Grissell, 1995: 184.

Type material.— *Torymus armatus* Boh. not seen.

*Diomorus nobilis* Walker: Eady (1959: 269) could not find type material. Walker himself synonymised *nobilis* with *armatus* (1846: 15).

Comments.— Mayr had seen two specimens from the Boheman collection and redescribed the species. This opinion is followed by subsequent authors.

Biology.— Reared from Sphecidae (Hym.) in stems of *Rubus*.

Distribution.— Widespread in Europe.

*Torymus artemisiae* Mayr, 1874

*Torymus artemisiae* Mayr, 1874: 105, ♀; Grissell, 1995: 275.

Type material.— In NHMW five specimens exist under this name, 2 ♂♂ (not described) and 3 ♀♀, on minutien pins mounted on two blocks. The female on the first block is here designated **lectotype**. It is labelled (1) "Collect. G. Mayr" (2) "*Tor. artemisiae* G. Mayr, Type" (3) "*Artem. scop.* Tultscha ..... [unreadable] Mai 75".

Comments.— The females on the second block have much paler legs and may not be syntypes.

The species is very close to *chloromerus* (Walker), but differs in small characters (see couplet 76 in the key to females).

Biology.— Reared from galls of *Rhopalomyia artemisiae* (Löw) (Dipt. Cecidomyiidae).

Distribution.— Romania.

*Torymus arundinis* (Walker, 1833)  
(figs 27-29, 241)

*Callimome arundinis* Walker, 1833: 124, ♀.

*Torymus arundinis*; Thomson, 1876: 83; Boucek, 1977: 24; Sellenschlo & Wall 1984:21; Tschardtke, Abraham & Vidal, 1991: 466-468, 472-473.

*Callimome Arundinis* Curtis, 1835: folio 552, ♀; Hoffmeyer, 1930: 238c, fig. 1b.

*Torymus arundinis* Curtis [sic]; Nikol'skaya & Zerova, 1978:371; Grissell, 1995: 275.

*Callimome compactus* Walker, 1834 161, ♂ ♀. **Syn. nov.**

*Torymus compactus*; Grissell, 1995: 278.

*Callimome Lasiopterae* Giraud, 1863: 1270, ♂ ♀.

*Torymus Lasiopterae*; Mayr, 1874: 99.

*Torymus bohemani* Thomson, 1876: 89, ♀; Graham, 1969: 68; Hansson, 1991: 11.

*Torymus antipai* Andriescu, 1971: 441-442, ♀; Grissell, 1995: 275. **Syn. nov.**

Type material.— *Callimome arundinis* [Curtis MS.] Walker: **lectotype**, ♀, (BMNH): designated by Eady (1959:268). Curtis validated his name only in 1835.

*Callimome compactus* Walker: Eady (1959: 269) stated that he had found no material in BMNH and Walker did not include it in either of his lists (1846, 1848).

*Callimome lasiopterae* Giraud: **lectotype**, ♀, (MNHN): here designated. There are 2 ♀♀ syntypes, mounted on minutien pins, stayed on a pith block, the right-hand ♀ is selected as lectotype. Labels: "Ex Lasiopt. arundinis 1 Mai; MUSEUM PARIS COLL. GIRAUD 1877; *Callimome Lasiopterae* Giraud [-Giraud's hand]; *Callimome arundinis* Curt. (*lasiopterae* Gir.) det. Hoffmeyer 1929; *Callimome lasiopterae* Giraud Lectotype ♀. M. de V. Graham '72".

*Torymus bohemani* Thomson: **lectotype**, ♀, (ZIL 1542:1): designated by Graham (1969: 68) who considered it possibly identical with *arundinis*; he later confirmed this. The synonymy was validated by Hansson (1991: 11); **paralectotype**, ♀, (NR): "GI; Bhn; Type; Thoms; Bohemani" [the latter pencilled in Thomson's hand].

*Torymus antipai* Andriescu: **holotype**, ♀, (?MHNB) The holotype (not seen) was captured in the delta of the Danube, which implies a habitat where *Phragmites* grows. From the description and habitat we conclude that *antipai* is conspecific with *arundinis* (Walker).

Comments.— *Callimome compactus* Walker: in the description Walker stated: "Taken near Paris, by M.F. de Laporte". Probably Laporte had only a single specimen of each sex and wished to retain them; however, no information is available regarding their location. The diagnosis is as follows: "Viridis, oviducto corpore vix longiore, antennis fuscis (mas) aut nigris (fem.), pedibus flavis, femoribus viridibus, alis hyalinis". The further description states (for both sexes) "antennae... articulus 1us. et 2us. viridi-aenei; ♂ 'metathorax [propodeum] splendide cupreus; Corp. long. 3/4-1 lin." [1.5-2 mm]. The combination of the above features does not appear to occur in any known European species except *T. arundinis*, dwarf specimens of which having dark-

er legs than usual, agree very well with the characters mentioned. Dwarf males agree particularly well, one seen having the propodeum bright coppery. Walker evidently did not know the male of *arundinis* and might have failed to recognise dwarf females as such. A male and a female *arundinis* (both dwarfs) which seem to agree well with the description of *compactus*, will be placed in BMNH under that name.

Variation.— The species is very variable in size as well in colour: the length varies from 2 to 4 mm in females; the colour of the body varies from green through more or less bronze-green and coppery-green to wholly coppery, the antennal scape may be wholly dark, or more or less pale below, the legs are usually reddish with mid and hind coxae, and fore coxae more or less, dark. Smaller specimens may have femora somewhat infuscate, even mainly fuscous in some dwarfs.

Biology.— Reared from galls of *Thomasiella arundinis* (Schiner) and *Giraudiella inclusa* (von Frauenfeld). An account of the biology is given by Tschardt et al. (1991).

Distribution.— Widespread, probably over whole Europe wherever large stands of *Phragmites* occur.

*Torymus aucupariae* (Rodzianko, 1908)

*Syntomaspis aucupariae* Rodzianko, 1908: 602-607, ♂ ♀.  
*Callimome aucupariae*; Hoffmeyer, 1930c: 236, 279; Milliron, 1949: 395-396.  
*Syntomaspis aucupariae* Ratzeburg [sic]; Nikol'skaya & Zerova, 1978: 369.  
*Torymus aucupariae*; Grissell, 1995: 275.

Type material.— Not located.

Comments.— The original rearing of *S. aucupariae* was from seeds of *Sorbus aucuparia* in Russia. European females of *T. aucupariae* are close structurally to the lectotype female of *T. aea* (Walker) in BMNH [= *Callimome aea* Walker, 1843: 104] a species at first attacking a *Megastigmus* (Torymidae) in seeds of *Amelanchier*, but sometimes phytophagous after the host was consumed, in North America.

Biology.— Reared from seeds of *Sorbus aucupariae* together with *Megastigmus brevicaudis* Ratzeburg (Hym. Torymidae).

Distribution.— Holarctic.

*Torymus auratus* (Müller, 1764)

*Cynips aurata* Müller, 1764: 68, no. 598, ♀.  
*Ichneumon* [*Cynipsichneumon*] *nigricornutus* Christ, 1791: 388, Pl 43, figs 7, 7, ♂ ♀. **Syn. nov.**  
*Ichneumon* [*Cynipsichneumon*] *rubicornutus* Christ, 1791: 388, Pl 43, figs 6, 6, ♂ ♀. **Syn. nov.**  
*Callimome nitens* Walker, 1833: 126, ♀. **Syn. nov.**  
*Torymus nitens*; Boucek & Graham, 1978a: 227; Grissell, 1995: 284.  
*Callimome inconstans* Walker, 1834: 159, ♀. **Syn. nov.**  
*Callimome lateralis* Walker, 1834: 160, ♀. **Syn. nov.**  
*Torymus nigricornis* Boheman, 1834: 355-356; Thomson, 1876: 94; Nikol'skaya & Zerova, 1978: 371; Selenschlo & Wall, 1984: 26; Grissell, 1995: 284. **Syn. nov.**  
*Torymus regius* Nees, 1834: 59, ♂ ♀; Mayr, 1874: 95; Györfi, 1962: 210. **Syn. nov.**  
*Torymus incertus* Foerster, 1840: xxxi, ♀; Graham, 1994e: 121-122. **Syn. nov.**

*Torymus longicaudis* Ratzeburg, 1844: 178, ♂ ♀. **Syn. nov.**  
*Callimome Amyrius* Walker, 1846: 110, ♀. **Syn. nov.**  
*Callimome flavipes* Parfitt, 1856a: 5074, ♂ ♀. **Syn. nov.**  
*Callimome devoniensis* Partitt, 1856b: 5255, ♂ ♀. **Syn. nov.**  
*Callimome abdominale*; Hoffmeyer, 1930c: 246 [misidentification].  
 ?*Torymus borealis*; Györfi, 1962: 209 [misidentification].

Type material.— Types of *Cynips aurata* Müller, *Cynipsichneumon nigricornutus* Christ and *Cynipsichneumon rubicornutus* Christ not found. (See under comments below). **Lectotypes** were designated for *Callimome nitens* Walker, *C. inconstans* Walker and *C. amyrius* Walker by Eady (1959: 265). No material of *C. lateralis* Walker was located.

*Torymus nigricornis* Boheman, 1834 No type material found.

*Torymus regius* Nees: original material destroyed. In BMNH a female, identified by Foerster and labelled as “*Call. regius* Nees” [in Foerster’s hand], is here designated as **neotype**. In the old Bm register is the annotation referring to this specimen: “1853/66 = 1 *Call. regius* from Germany (prob. Aachen) presented by F. Smith, named by Foerster”.

The **lectotype** of *Torymus incertus* Foerster, ♀ (BMNH) is designated by Graham (1994).

*Torymus longicaudis* Ratzeburg: no type is designated yet.

*Callimome flavipes* Parfitt: the specific name is preoccupied by *C. flavipes* Walker, 1833. It was renamed *devoniensis* by Parfitt.

*Callimome devoniensis* Parfitt: 3 ♀ ♀ in BMNH, all conspecific with *auratus* (Müller). One specimen labelled “*Devoniensis*. Parfitt Zool. (ogist)” on a pale blue label, is here designated **lectotype**; it is also labelled “*Callimome flavipes* Parfitt (= *devoniensis* Parfitt) LECTOTYPE M de V. Graham & Boucek det. 1976” Two other ♀ ♀ are designated **paralectotype**.

Comments.— *Cynips aurata* Müller: Müller gives a short description, which is an extract from the original text of Rösel (1755 ins. 3 t.69), to which he refers. Rösel reported comprehensively on the biology of the host, *Cynips longiventris*, and of the parasite. He described and illustrated the larvae and adults of both species. The figures, descriptions and the biology leave no doubt that the parasite in question is *Torymus nitens* auctt., a common species in oak galls. The only uncertainty lies in the coloured figure in which the antennae are painted crimson. This phenomenon does not occur in any of the known *Torymus* species in Europe. In the text, Rösel describes the colours of the body: nice green and golden shiny with yellowish legs and red-brown eyes, without referring to red antennae! Moreover he compares this species with another one, figured on table 53, described on page 300. Here again he describes several characters: he compares differences in shape of antennae, saying nothing about their colour. In the figure of this species, the antennae are black. Finally, Rösel cites Réaumur, comparing his own specimens to Réaumur’s, stating: “Their body and breast were beautiful green and had moreover a golden shine, as Spanish flies used to have. The legs were yellowish, the antennae short and black, and the latter colour had the head as well”. It is unlikely that Rösel would not have mentioned red antennae in his own species if there were. We conclude that the red antennae are due to an error of the colourist. Apparently Müller and Christ copied the description and took the character of red antennae from the painting.

The conclusion must be that Müller is the first to name the species described and figured by Rösel von Rosenberg (1755). Christ (1791: 388) seems to have used Rösel’s descriptions without mentioning the source.

*Cynipsichneumon nigricornutus* Christ. Original material presumed lost. The



description, though brief, the figures, and the statement that the species is a parasite in oak-galls, especially *Cynips quercusfolii*, convince us that Christ had before him the species currently known as *Torymus nitens* (Walker). Christ's statement about the ovipositor ("Das Gewerb seines Legestachels steht unter den ersten Ring seines Hinterleibes") is explained by his figure 7 which shows the basal sternite and the ovipositor directed nearly vertically with respect to the body, i.e., in the position adopted during oviposition. This state is rarely found in collections. It suggests that Christ is plagiarising Rösel von Rosenhof, who pictured the species in a similar posture though in mirror image.

The description of *Cynipsichneumon rubicornutus* Christ is again a redescription of previous ones. However, the drawing is different showing a larger species with a tooth on the femur and a partly pale coloured gaster. It seems that Christ described a *Torymus* and made a drawing of a *Diomorus* (presumably *calcaratus* Nees., now *Torymus calcaratus* Nees.).

*Callimome lateralis* Walker: perhaps Laporte had only one specimen which he wished to keep; in the case of *inconstans* he must have had at least four, and three are in BMNH.

*Torymus nigricornis* Boheman: the name is based on a misinterpretation of *Ichneumon nigricornis* Fabricius, 1793.

*Torymus regius* Nees: a female in the remnants of the Nees collection in Oxford, labelled "regius" by Westwood, disagrees with the description and cannot be a syntype; see Graham, 1988: 25-24.

*Torymus incertus* Foerster: in BMNH are one male and one female on minutien pins, staged on pith block. The female has left flagellum broken off after F5. The gaster is broken off and attached to a card below block. Both male and female are *T. auratus* (Müller); the female is selected as lectotype. BMNH Register 41846 states: "no. 16 Aix La Chapelle Presented by Edward Doubleday". A further note on page 203 of the Register states "the whole of the specimens under 46.16 were named by Dr. Foerster of Aix la Chapelle".

*Torymus longicaudis* Ratzeburg: a pair was located in the remnants of the Ratzeburg collection in Eberswalde (Boucek, 1964: 669). They belong to the present species [*auratus* (Müller)] but Boucek was not certain that the specimens were original material.

*Callimome devoniensis* was synonymised with *nitens* by Boucek & Graham (1978: 227).

It is interesting to note that Degeer (1771: 879) in dealing with insects produced from oak-galls, figured a *Torymus* (Pl. 30, fig. 21) which he observed piercing an oak gall (p. 881). In 1959 Graham examined male and female specimens in his collection amongst "Ichneumons des Galles du Chêne"; they belonged to *auratus* (Müller).

Variation.— Morphological: in *T. nigricornis* [= *auratus* (Müller)] Askew (1965: 228) showed ovipositor length to be different on average in the first and second generations, with only a small overlap. The ovipositor index has been measured by us in a number of specimens. In females emerging in May, June and July the index varied from 3.0 to 4.0. In those emerging in August and September the index was 3.9-4.3. Colour: normally in females the legs, apart from the coxae, are pale yellow, the femora sometimes reddish-yellow. In northern Europe, specimens of the spring generation

often have the hind femora darkened medially (rarely also the fore and mid femora in dwarfs) but this is not usually the case in those from southern and central Europe. The body is bright green to blue, sometimes golden-green.

Biology.— A parasite in many species of cynipid oak galls.

Distribution.— All over Europe.

*Torymus austriacus* Graham, 1994  
(figs 30-33)

*Torymus austriacus* Graham, 1994a: 31-32; Grissell, 1995: 275.

Type material.— **Holotype**, ♀ (BMNH): Germany, "Thüringen, Schmiedeknecht". **Paratypes**: 2 ♀♀ (BMNH): Czech Republic, "Moravia merid., Cejc, v.1941, A. Hoffer"; 1 ♀ (BMNH), Slovakia, "Velky Bab, 5.v.1953, Boucek"; 1 ♀ (BMNH) Germany, "Thüringen, Schmiedeknecht".

Non-type material: 3♂♂ + 1 ♀ (BMNH), "Hungary, Baranya, Beremend, 24.iv-9.v.1963, L. Horaczek".

Description of male (new): Differs from that of *imperatrix* spec. nov. as follows.— POL 0.9-1.0 OOL. Antenna with F1 1.5-1.75 times length of pedicellus and 1.65-2.0 times as long as broad, following segments decreasing slightly in length but even F7 is a little longer than broad in one male having complete flagellum (more or less incomplete in the other specimens).

Biology.— Unknown.

Distribution.— Austria, Czech Republic, Germany, Hungary, Yugoslavia.

*Torymus azureus* Boheman, 1834  
(figs 34-36, 242)

*Torymus azureus* Boheman, 1834: 369-370, ♀; Bakke, 1955: 164-170; Boucek, 1977: 24; Nikol'skaya & Zerova, 1978: 370; Sellenschlo & Wall, 1984: 22; Grissell, 1995: 275.

*Torymus chalybaeus* Ratzeburg, 1844: 179-180, ♂♀.

*Callimome Erdösi* Györfi, 1945: 6, ♂♀. **Syn. nov.**

*Torymus Erdösi*; Erdös, 1960: 20, fig 7; Sellenschlo & Wall, 1984: 24.

*Torymus erdosi*; Grissell, 1995: 280.

Type material.— A **neotype** of *T. azureus* Boheman ♀ (ZIL), is designated by Graham. It is labelled "Sk [Skåne] Dalby 900409 {9 April 1990} ex spruce cones" and bears Dr. Hansson's det. label. (see for details under comments).

*T. chalybaeus* Ratz.: **lectotype**, ♀, (DEI), designated by Boucek (1964: 671).

*C. erdosi* Györfi: a **lectotype**, ♀, (HNHM) is designated by Thuróczy (1992: 131).

Comments.— *Torymus azureus* Boheman. The holotype female was taken by Dalman "in Vestrogothia" (Boheman, 1834: 369). Graham was unable to find any specimens with this data in Boheman's collection in 1959. Mayr (1874: 100) stated that he had seen "ein typisches Weibchen", which possibly has been mislaid or lost. Mayr also confused this species with *caudatus* Boheman, so that his statement is not decisive. Thomson (1876: 84) clearly indicated the differences between the two species and his opinion is no doubt correct as he saw the material then in Boheman's collection, including the specimen which had been sent to Mayr (see his Swedish footnote

on this and other *Torymus* (1876: 75)). His opinion has therefore been followed. Graham has not found the holotype of *azureus* in Thomson's collection either. No fresh material from Vestrogothia [Västergötland] is available, however, a series was taken in Skåne by Dr. Christer Hansson and as this in Southern Sweden and nearly adjacent to Västergötland, a neotype is designated from that series.

*Torymus chalybaeus* Ratzeburg. Boucek (1964: 671) found one male and two female specimens in the remnants of Ratzeburg's collection in Eberswalde. He designated as lectotype a female labelled "strobil. Harz" and "*chalybaeus* R." and stated that Mayr's synonymy of *chalybaeus* with *azureus* was correct.

*Callimome Erdösi* Györfi: Graham saw the type series in 1973 and found it a synonym of *azureus* Boh.

**Biology.**— Parasite of *Kaltenbachiola strobi* (Winnertz) and *Plemeliella abietina* (Seitner) (Dipt. Cecidomyiidae) in cones of *Picea*. Bakke (1955) was the first to give a satisfactory account of the biology.

**Distribution.**— Austria, Belgium, Britain, Czech Republic, Denmark, Finland, Germany, Hungary, Netherlands, Poland, Slovakia, Spain, Sweden, Switzerland, Yugoslavia.

*Torymus basalis* (Walker, 1833)  
(fig. 37)

*Callimome basalis* Walker, 1833: 125, ♀.

*Torymus basalis*; Sellenschlo & Wall, 1984: 22; Grissell, 1996, 276.

Type material.— **Lectotype**, ♀, (BMNH): designated by Eady (1959: 263).

**Biology.**— In galls of *Rhopalomyia millefolii* (Loew) (Dipt. Cecidomyiidae) on *Achillea millefolium*.

**Distribution.**— France, Germany, Great Britain, Ireland, Netherlands.

*Torymus baudysi* Boucek, 1954  
(figs 38-39, 243)

*Torymus (Syntomaspis) baudysi* Boucek, 1954: 60-62, ♀; Sellenschlo & Wall, 1984: 20; Grissell, 1996: 276.

Type material.— **Holotype**, ♀, (NMP, type no. 3048): Czech Republic, Hradec Králové-Piletice.

**Comments.**— In Europe *Torymus baudysi* is the only known representative of the Nearctic *tubicola* species-group as defined by Grissell (1976: 12, 61-89). It is very close to the Nearctic *T. thalassinus* (Crosby), as redescribed by Grissell (1976: 85) who remarked "it is possible that *thalassinus* occurs in the Palearctic region under a different name". From specimens of *thalassinus* examined and from Grissell's redescription it appears that *baudysi* is different. The female differs in having F1 to F7 usually quadrate (not transverse), or at most F6 and F7 very slightly transverse in small specimens. All European specimens have the colour of the body blue to blue-green, the antennal scape mainly to wholly black, femora mainly black, and at least the hind tibiae broadly black. The males of *baudysi* have F1 to F7 quadrate, or F1 even slightly elongate,

whilst the body is coloured like that of the female. Like *baudysi*, *thalassinus* has been reared from the stems of grasses (some of which occur in Europe), possibly as a parasite of *Tetramesa* spp. (Eurytomidae).

Biology.— In the Czech Republic it has been reared from *Tetramesa calamagrostidis* Hedicke on *Calamagrostis epigeios*. In Great Britain it has been found on the sea-coast; in Lincolnshire Graham swept it from *Elymus farctus* (Viv.) subsp. *boreali-atlanticus* (= *Agropyron junceiforme* of authors) so it may be a parasite of *Tetramesa hyalipenne* (Walker). A female was taken at Calais (France) in 1830 by Curtis.

Distribution.— Czech Republic, France, Great Britain, Hungary, Netherlands, Sweden.

*Torymus bedeguaris* (Linnaeus, 1758)  
(figs 40-41)

*Ichneumon Bedeguaris* Linnaeus, 1758: 567, ♀ (ex parte); 1761: 408 (ex parte).

*Cynips bedeguaris* Geoffroy in Fourcroy: 1785: 379-380; Graham, 1994d.

*Torymus bedeguaris*; Mayr, 1874: 101-102; Thomson, 1876: 87; Eady, 1959:262; Grissell, 1976: 19-21; Bouček, 1977: 24; Nikol'skaya & Zerova, 1978: 371; Sellenschlo & Wall, 1984: 22, 102; Grissell, 1996, 276.

*Callimome bedeguaris*; Hoffmeyer, 1930c: 238.

*Cynips viridis* Geoffroy in Fourcroy: 1785: 380, ♂; Graham, 1994d.

*Cynips rosae aurata* Christ, 1791: 479, Pl. 56, fig 3, ♀. **Syn. nov.**

?*Callimome pretiosus* Walker, 1833: 121, ♂; Grissell, 1995: 286.

*Torymus elegans* Boheman, 1834: 352-353, ♂ ♀.

*Torymus Försteri* Ratzeburg, 1844: 178, ♀ (ex parte, ♀ from *bedeguar*).

*Callimome divisus* Walker, 1871: 34, ♀.

[*Torymus druparum* Boheman; Mayr, 1874: 103. Misidentification].

*Callimome rosarum* Hoffmeyer, 1929: 334, ♀. **Syn. nov.**

Type material.— The **lectotype** of *Ichneumon bedeguaris* L. ♀ (NR) is here designated. It is mounted on a thick pin and bears no original labels but has been labelled lectotype by Graham. See for details under comments.

*Cynips rosae aurata* Christ: original material not found.

*Callimome pretiosus* Walker: original material lost.

*Torymus elegans* Boheman: **Lectotype**, ♀, (NR): labelled "Sm" "Bhn" "*Torymus elegans* Boh. M. de V. Graham det. 1994. lectotype ♀". The designation is here validated.

*Torymus foersteri* Ratzeburg: type material lost.

*Callimome divisus* Walker: **lectotype**, ♀, (BMNH): here designated, labelled (1) "Marshall coll. 1904-120; Torla [on underside of card]" (2) "In B.M. 1952 under *Torymus divisus* Walk; *Torymus bedeguaris* L. det. R.D. Askew, 1952" (3) Lectotype label fixed by Graham.

Comments.— *Ichneumon bedeguaris* L.: as *bedeguaris* is the type species of *Torymus* it is important to define it objectively, since Linnaeus obviously described it from a mixed series. Thomson (1876: 100) inserted the following note: "In collectione DeGeeriana adhuc asservantur *T. Bedeguaris*, quod specimen ad Linneanum speciem pertinet ...". The original description by Linnaeus (1758: 567) is slightly ambiguous: "*T. auratus*, thorace viridis, abdomine aureo ... Habitat in Gallis Rosae, Quercus. Aculeus longitudine corporis". The supposed *bedeguaris* from *Quercus* galls were clearly not *bedeguaris* but from the name the concept can be restricted to exclude them. Also in

1761 he added the words “Abdomen ... ignei coloris”, which can be applied only to *bedeguaris* as generally understood. DeGeer (1771: 877-878) described “*Ichneumon doré du bedeguar*” giving a reference on p. 877 to *Ichneumon bedeguaris* Linnaeus, 1761. No material has been found in the Linnaean collection (Linnean Society, London). From other evidence we are satisfied that Linnaeus described a number of species from material in DeGeer’s collection and did not have material himself. In cabinet 36, drawer 5 of the DeGeer collection (NR) there is a female *Torymus bedeguaris* as generally understood. It was examined by Graham in 1959 and in 1994. It is in good condition except that the right-hand middle legs and the left-hand middle and hind legs, are missing. The gaster is detached and is mounted on a card below the rest of the specimen”. (This specimen is designated lectotype). The Degeer collection also contains a female of *Torymus auratus* (Müller), which is probably the species from *Quercus* mentioned by him in 1758. Linnaeus cited Rösel (1755, Pl. 53, figs F, H) which show a female *auratus* (Müller) and fig. 3, illustrating a gall of *Cynips quercusfolii* from which it emerged.

*Cynips viridis* Geoffroy: synonymised with *bedeguaris* by Graham in 1994d.

*Cynips rosae aurata* Christ: Strictly speaking *rosae aurata* may not be an available name. Article 11 (h)(v) of the Code states “if a species-group name is published as separate words that together represent or refer to a single entity (e.g., host species, geographical area), in a work in which the author has otherwise consistently applied the Principle of Binomial Nomenclature ..... the component words are deemed to form an available name (and are united without a hyphen .....”. The section continues under “Examples”. - “However, the words *aquilegiae flava* in *Aphis aquilegiae flava* ..... do not form an available specific name because they are a descriptive phase not based on the name of a single entity.” *Cynips rosae aurata* appears to be such a case. The description applies very well with some females of *bedeguaris*, and seem applicable to nothing else, although Christ’s rendering of the wing-venation seems to be a phantasy, while the antenna figured do not agree with the description.

*Callimome pretiosus* Walker: only the male is described (number not stated, possibly a single specimen) “Reared with *C. Bedeguaris*, by Mr. Curtis, from the galls of the dog-rose”. In the Curtis collection (MVMA) only one female stands under *pretiosus* and it is a female of *Torymus formosus* (Walker). Possibly the original material was loaned to Walker and has since been lost. Graham has a male of *T. bedeguaris*, reared from a bedeguar gall on rose, which agrees well with the brief description of *pretiosus*; the gaster is not yellow as required, but has an obscurely testaceous spot on each side near the base.

*Torymus elegans* Boheman: two females stand under this name in the Boheman collection (NR), but one is not a syntype. The second one lacks flagellum and gaster. Mayr (1874: 102) treated *elegans* as a valid species, having seen Boheman’s material but Thomson (1876: 65, 87) corrected him and stated that it was the same as *bedeguaris*, pointing out at the same time that Mayr had further redescribed *bedeguaris* as supposed *druparum*.

*Torymus foersteri* Ratzeburg: Ratzeburg had two females, sent to him by Saxesen. One had emerged from a *Rosa* bedeguar gall, the other from a beech-leaf gall. From the description it is clear that the first female belongs to *bedeguaris*, the second to some other species. Mayr (1874: 101) placed *foersteri* in synonymy with *bedeguaris* and this is

accepted here, by taking as representative the first female mentioned by Ratzeburg, reared from *bedeguar*.

*Callimome divisus* Walker: curiously, Eady (1959: 262) said that no material of *divisus* had been found! He said that from Walker's description it appeared most probably to be *bedeguaris*, with which he synonymised it. Graham found the original specimen in 1994 in BMNH.

*Callimome rosarum* Hoffmeyer: Mayr (1874: 103) redescribed what he supposed to be *druparum* Boheman basing this description upon a female which he thought to be the type. Thomson (1875 (1876): 65) pointed out that Mayr had based his identifications of *Torymus* upon material of 33 specimens from the Stockholm museum, which Dr. Stål subsequently loaned to Thomson. Amongst this material was the supposed type of *druparum* Boheman, which Thomson stated to be a female *bedeguaris*. Thomson confirmed the synonymy on p. 87 of his work (incidentally citing Mayr's description of "*druparum*" as page 51, clearly taken from a repaged reprint; the actual page number should be 103).

Mayr's citation of *druparum* was a misidentification, not a homonym. Therefore the name *Callimome rosarum* Hoffmeyer, 1929 was not a nomen novum as Hoffmeyer suggested but a description of Mayr's species. Mayr's account of "*druparum*" accords with rather small females of *bedeguaris* having the hind femur somewhat darkened. Therefore *C. rosarum* Hoffmeyer becomes a synonym of *Torymus bedeguaris* (Linnaeus, 1758). There are female specimens in MNHN labelled as *Callimome rosarum* by Hoffmeyer, but they are a species different from *T. bedeguaris*.

Egg, larva and pupa are described and figured by Sellenschlo & Wall (1984: 102).

Variation.— The specimens are fairly constant in colour. The female usually has the posterior half or more of the gaster coppery, rarely bronze green. In very small females the hind femora, or all the femora, may be more or less infuscate and rarely in dwarfs the hind tibiae are infuscate medially. In the lectotype the forewing is hyaline, the venation uniformly light brownish. In most European females the parastigma and stigmal vein are somewhat darker than the rest, while in some there is a weak brownish cloud around the stigma and a few have a weak brownish tinge, or a brownish longitudinal streak, discally. Grissell (1976: 20) stated that North American females tend to have the ovipositor on average rather shorter than in European ones.

Biology.— A common parasite in galls of *Diplolepis* spp. on *Rosa*.

Distribution.— Holarctic.

*Torymus boops* Graham, 1994  
(figs 42-43)

*Torymus boops* Graham, 1994a: 24-25, ♀; Grissell, 1996: 277.

Type material.— **Holotype**, ♀, (BMNH): "Slovakia, Slovensky Raj, Klasterisko, 27.vii.1965, Graham".

**Paratypes**: 1 ♀, (BMNH): Czech Rep. "Bohemia bor., Studenec u Decina, reared ix. 1953 from *Wachtliella rosarum* Boucek"; 1 ♀ (BMNH) Crna Gora, Durmitor, near Zabljak, 6.vii.1968, Boucek".

Biology.— Reared from galls of *Wachtliella rosarum* (Hardy).

Distribution.— Czech Republic, Slovakia.

*Torymus borealis* Thomson, 1876

*Torymus borealis* Thomson, 1876: 83, ♀; Grissell, 1996: 277

Type material.— **Lectotype**, ♀, (ZIL): selected by Graham and validated by Hansson (1991: 11); labels "B.S." [Botnia septentrionalis]; "Bhn."; "*borealis* Thoms."

Biology.— Unknown.  
Distribution.— Sweden.

*Torymus bouceki* spec. nov.  
(fig. 44)

Type material.— **Holotype**, ♀, (BMNH): Czech Republic, "Bohemia: Lnáře, *Rhabdoph. salicis* 1952 Hof-fer". **Paratype**: ♀, (NMP): "Slovakia: Gelnica, iv.1952. V. Pasek ex *Rhabdophaga salicis*".

Description of female.— Morphology: head in dorsal view 2.1 times as broad as long; temples 0.21 times as long as eyes, rather strongly convex, curved. POL 1.65-1.8 OOL, OOL 1.6 OD. Vertex finely reticulate, scattered with fine punctures. Frontally seen the mouth is 1.9 times malar space the latter 0.3 times length of eye; genae virtually straight. Clypeus as in *epilobii* (fig. ). Antennae (fig. 44) with toruli well above lower eyeline, slightly nearer to clypeus than to anterior ocellus; scape not reaching level of lower edge of anterior ocellus; pedicellus plus flagellum 1.25 as long as breadth of head; pedicellus 1.6-1.65 times as long as broad; anellus 1.3 times as broad as long; F1 slightly longer than broad, F2 hardly so, F3-F6 quadrate, F7 very slightly transverse; sensilla numerous uniseriate.

Mesosoma 1.66 times as broad as long, moderately arched; notauli rather shallow. Mesoscutum 1.35 times as broad as long, finely reticulate, more scaly rippled in front half, punctures numerous, very small, separated by about twice their diameter; setae of normal length slightly raised. Scutellum 1.25 times as long as broad with rounded base, sculpture as on mesoscutum, punctures hardly larger than on mesoscutum, flange extremely narrow, with indistinct trabeculae. Dorsellum virtually smooth. Propodeum with very finely alutaceous sculpture, medially smooth, with very small fovea. Mesepimeron distinctly longer than broad, shorter than mid coxa. Hind femur 3.8 times as long as broad; hind coxa 2.4 times as long as broad, moderately curved, sparsely hairy in basal half, with somewhat coarse, slightly raised reticulation. Forewing 2.43 times as long as broad; costal cell 10 times as long as broad, upper side with one row of setae in distal half, underside with one complete row plus scattered hairs in distal two-fifth and proximal quarter; basal cell closed with 2 hairs below SM; basal vein with 4 setae; speculum extending somewhat beyond parastigma, open for about two-third its length; relative lengths of M:PM:ST=67:17:6.5 .

Gaster slightly compressed; basal sternite extending beyond coxa by about one-third; hypopygium bare except tip, extending about three-quarters along gaster. Ovipositor sheaths as long as metasoma plus half mesosoma, index 1.85-2.1. Length 2.2-2.4 mm.

Colour: dark blue-green with golden reflections in part, gaster with first segment green, the rest strongly violaceous. Antennae dark brown, scape testaceous ventrally. Palpi and tegulae testaceous. Coxae concolorous with body, except fore coxae which

are partly testaceous. Legs testaceous, except hind femora which are metallic in the middle and last tarsal segments which are brown. Wing veins testaceous.

Male.— Unknown.

Comments.— The species can be separated from related species by the characters used in the key. It differs from the other species known from *Rabdophaga salicis* (*tipulariarum* and *partitus*) as follows: *tipulariarum* has a hairy hypopygium and *partitus* has a larger ovipositor index.

Biology.— Reared from galls of *Rabdophaga salicis* (Schrank) (Dipt. Cecidomyiidae).

Distribution.— Czech Republic, Slovakia.

*Torymus brachyurus* Boheman, 1834  
(fig. 45)

*Torymus brachyurus* Boheman, 1834: 354-355, ♀; Mayr, 1874: 129; Thomson, 1876: 98; Boucek, 1977: 25; Nilsson, 1979: 540; Grissell, 1995: 277.

*Callimome brachyurum*; Hoffmeyer, 1930c: 239.

?*Torymus brachiurus* [sic]; Györfi, 1962: 210.

Type material.— One female in the Boheman collection (NR), here designated **lectotype**; labels “VG” [Vestrogothia]; “Bhn”.

Comments.— The lectotype may be the specimen which Mayr saw.

Biology.— Unknown.

Distribution.— Croatia, France, Great Britain, Italy, Sweden.

*Torymus breviscapus* spec. nov.

Type material.— **Holotype**, ♀, (BMNH): England “Cingov (cliff) (3) 28/7/65” [Graham].

Description of female.— Morphology: head in dorsal view 2.1 times as broad as long, temples 0.25 apparent length of eye, curved. POL 1.6 OOL, OOL 1.4 OD. Vertex shiny, coarsely reticulate with numerous small punctures, elevated around ocellar triangle. In frontal view the head is 1.3 times broader than high. Clypeus truncate. Mouth 2.35 times malar space, the latter 0.32 length of eye, genae straight. Lower face alutaceous, shiny, sparsely set with long white hairs, a raised fold runs from the space between the toruli till clypeus. Upper face nearly bare. Antennae with toruli above eyeline, but distinctly nearer to clypeus than to anterior ocellus; scape 0.6 length of eye, 3.2 times as long as broad; anellus twice as broad as long; pedicellus plus flagellum 1.1 times breadth of head, very slightly clavate; pedicellus 1.6 times longer than broad; F1 quadrate, following segments quadrate or very slightly transverse; clava 1.6 times longer than broad; sensilla sparse uniseriate.

Mesosoma 1.7 times as long as broad. Mesonotum 1.3 times as broad as long, coarsely reticulate with many minute punctures, with normal more erect setae. Scutellum 1.2 times as long as broad, reticulation as on mesonotum, setae in posterior part much longer and more erect, posterior part has an indication of a cross furrow, indicating a frenal area, flange narrow with a few weak trabeculae. Propodeum with alutaceous sculpture. Mesepimeron 1.3 times longer than broad and shorter than



mid coxa (13:18). Hind leg with coxa 2.3 times as long as broad, dorsally hairy in basal half; femur 4.6 times as long as broad, rather coarsely reticulate, shiny; spur of hind tibia slightly longer than breadth of tibia and 0.45 length of basitarsus. Fore wing 2.5 times as long as broad; costal cell on dorsal side with one complete hairrow and a second one in apical half, lower surface with two complete rows and two additional ones in apical half; basal cell with four setae, closed; basal vein with five setae; speculum reaching M, nearly closed. M:PM:ST=45:15:7.5, stigma petiolate.

Gaster with first sternite hardly longer than hind coxa; hypopygium extending 0.75 along gaster, bare except for some hairs at tip. Ovipositor index 2.3. Length 2.2 mm.

Colour: green to blue-green, head green with brassy tinge; scape dark metallic green, funicle brown; palpi brown. Dorsum of mesosoma blue-green; all coxae and femora green, tibiae brown, hind tibiae darker, tarsi dark testaceous, last segment brown. Tegulae brown.

Male.— Unknown.

Comments.— The species differs from the other species of *Torymus* by its short scapus, the many piliferous punctures on vertex, which is elevated around the ocelli and the slightly indicated frenal area.

Biology.— Unknown.

Distribution.— Great Britain.

#### *Torymus calcaratus* Nees, 1834

*Torymus calcaratus* Nees, 1834: 69, ♂.

*Diomorus calcaratus*; Mayr, 1874: 74; Giraud, 1866: 489-490; Hoffmeyer, 1930: 254, 255; Boucek, 1954: 59; 1977: 19; 1994: 119; Nikol'skaya & Zerova, 1978: 368; Sellenschlo & Wall, 1984: 29; Graham 1992a: 12, 113.

*Torymus igneiventris* Costa, 1858: 27; Mayr, 1874: 75; Masi, 1919: 130-132.

*Diomorus violaceus* Kieffer, 1898: 123, ♀; Masi, 1919: 131; Hoffmeyer, 1930c: 254; Grissell, 1995: 184-185.

*Diomorus fertoni* Kieffer, 1898: 123-124, ♂; Boucek, 1994: 119.

Type material.— *Torymus calcaratus* Nees, ♂, type presumed to be lost.

*Torymus igneiventris* Costa: type material not traced.

*Diomorus violaceus* Kieffer: type material not found.

*Diomorus fertoni* Kieffer: **holotype**, ♂, (MNHN); Boucek (1994) confirmed the synonymy, which was first suggested by Masi (1919).

Biology.— Reared from Sphecidae (Hym.) in *Rubus* stems and in oak galls.

Distribution.— Widespread in Europe.

#### *Torymus caledonicus* spec. nov.

(figs 46-47)

Type material.— **Holotype**, ♀, (BMNH): "Scotland, MP [Mid Perth] Granish, nr. Aviemore, 24.6.1965 M. de V. Graham".

Description of female.— Morphology: head in dorsal view (fig. 47) 1.8 times as broad as long; temples 0.44 apparent length of eyes, distinctly rounded POL 1.7 OOL, OOL 1.2 OD. Vertex with extremely fine hardly raised reticulation, with a few minute

punctures in ocellar triangle and at the sides. Frontally seen, the head is distinctly transverse, with slightly curved genae. Mouth 2.15 times length of malar space, the latter 0.37 length of eye. Clypeus very slightly produced, weakly curved. Antennae (fig. 46) with toruli well above lower eyeline; scape not reaching lower edge of anterior ocellus; pedicellus plus flagellum 1.1 times breadth of head, flagellum proximally not much stouter than pedicellus but thickening strongly distad; pedicellus 1.6 times as long as broad; anellus slightly broader than long; F1 subquadrate, the other funicle segments slightly transverse; clava 1.5 times as long as broad; sensilla rather sparse, uniseriate.

Mesosoma 1.7 times as long as broad, strongly arched. Mesonotum nearly 1.5 times as broad as long, slightly shiny with fine, nearly isodiametric sculpture, which is more scaly in frontal third, punctures numerous but minute; setae slightly raised. Scutellum 1.2 times as long as broad, with broadly rounded base, sculpture as mesoscutum, with very small and remote punctures, setae raised, long in hinder third; flange extremely narrow, without distinct trabeculae. Dorsellum nearly smooth. Propodeum shiny with fine superficial alutaceous sculpture and a row of minute fovea at base. Mesepimeron longer than high, distinctly shorter than mid coxa. Hind coxa 2.2 times as long as broad, with somewhat coarse and slightly raised reticulation, its hind edge strongly curved with 6-7 setae dorsally in basal half. Hind femur 3.8 times as long as broad; spur of hind tibia 0.52 length of basitarsus. Forewing 2.2 times as long as broad, costal cell about 8.5 times as long as broad, with on upper surface one row of setae and on lower surface one row plus scattered setae in basal fifth and in distal third. M:PM:ST=52:14:7, stigma shortly petiolate, small and nearly circular; basal cell with a few setae below SM, closed below; basal vein with four setae; speculum moderately large, extending slightly beyond tip of parastigma, nearly closed.

Gaster ovate, not compressed, in profile relatively short; basal sternite slightly longer than coxa; hypopygium extending three-quarters along gaster, bare except tip. Ovipositor index 2.05, sheaths as long as metasoma plus one third of mesosoma. Length 2.0 mm.

Colour: bright blue-green; mandibles and palpi testaceous. Antennae black, scape yellow beneath. Coxae, and hind femora except tips, coloured as body; fore and mid femora fuscous in basal two-third; hind tibiae broadly infuscate, rest testaceous with fifth segment of tarsi brown. Tegulae brown with anterior edge yellowish. Wings hyaline, venation testaceous with parastigma and ST slightly darker.

Male.— Unknown.

Comments.— This species is recognisable by the combination of characters given in the key to females, couplet 106.

Biology.— Unknown.

Distribution.— Scotland.

*Torymus canariensis* Hedqvist, 1977

*Torymus canariensis* Hedqvist, 1977: 235-236, ♂ ♀.

Type material.— **Holotype**, ♀, (KJH): "Canary Is. Tenerife Taganana26.xi.1975 K.-J. Hedqvist" "galls on *Artemisa* [sic] *canariensis*" "HOLOTYPUS ♀ *Torymus canariensis* n. sp. K.-J Hedqvist det. 1977. **Paratypes**: 6 ♀ 18 ♂♂, (KJH): same locality.

Comments.— The species closely resembles *T. phillyreae* Ruschka but differs as follows: Head 1.9-2.1 times as broad as long. Underside of costal cell of forewing with an interrupted hairline. Ovipositor sheaths longer, index 1.85-2.4, 1.15-1.5 times as long as gaster. Hypopygium bare except a few setae at tip. Dorsal surface of hind coxae bare (in *phillyreae* nearly always with 2 or more setae, very rarely bare). Antennal scape barely reaching, or only just reaching, lower edge of anterior ocellus.

The female specimens from the Spanish mainland differ slightly from the holotype in having darker legs: the fore coxae are metallic-green anteriorly in at least proximal half, sometimes even wholly green, the hind femora have at least a metallic shine medially; the fore and mid femora usually have a fuscous stripe, the hind tibiae are dark-lined on posterior edge and the mid and fore tibiae are often more or less dark-lined. Moreover, the specimens from the islands are smaller: 1.2-1.8 mm, those from Spain are 1.7-2.4 mm, two specimens are 3.3 mm. They emerged from galls formed by the tephritid fly *Ptoelidaspidis tavaresiana*, whilst others, reared from the same galls, were of normal length. It is possible that the smaller specimens lived on an inquiline gall midge. The larger specimens may have lived on the fly itself.

The male appears to differ from that of *phillyreae* only in having the hind coxa bare dorsally in basal half and the pale band on gaster which is often very distinct, yellow, then forming a complete ring which extends on the dorsal surface.

This species is mentioned under *T. phillyreae* Ruschka by Graham (1994b) as a possible form of that species.

Biology.— Reared from galls of *Rhopalomyia navasi* Tavares (Dipt. Cecidomyiidae) and *Ptoelidaspidis tavaresiana* (Bezzi) (Dipt. Tephritidae) on *Artemisia herba-alba* and from *Rhopalomyia baccarum* (Wachtl) (Dipt. Cecidomyiidae) on *Artemisia campestris*.

Mr. B. van Aartsen, 't Harde The Netherlands, identified the tephritid species.

Distribution.— Spain, including Canary Islands.

*Torymus capitonis* spec. nov.  
(figs 48-49)

Type material.— **Holotype**, ♀, (RMNH): "France Vaucluse M.J. Gijswijt, Gigondas (Beauregard) 21 ix 1989".

Description of female.— Morphology: head in dorsal view (fig. 48) 1.6 times as broad as long; temples 0.38 apparent length of eye. POL 2.5 OOL, OOL 0.9 OD. Vertex finely reticulate without punctures. Frontally seen the head is oval with straight genae; clypeus truncate. Antennae with toruli well above lower eyeline, only slightly nearer to clypeus than to anterior ocellus; scape 3.2 times as long as broad, reaching middle of anterior ocellus; pedicellus plus flagellum 1.4 breadth of head, flagellum slightly clavate; pedicellus 1.6 times as long as broad; anellus narrow and quadrate; F1 1.25 times as long as broad, distinctly broader than pedicellus, F2-F3 longer than broad, F4-F6 quadrate, F7 transverse; clava 2.1 times as long as broad; in side view F1 has one sensillum, F2 and F3 three, the other segments more.

Mesosoma 1.9 times as long as broad. Mesonotum 1.26 times as broad as long, sculpture as on vertex but transversely rippled, without visible punctures, setae short, slightly raised. Scutellum 1.2 times as long as broad, sculpture as on mesoscutum,

with a few small punctures and truncate at base. Propodeum with alutaceous sculpture. Mesepimeron 1.2 times longer than broad, as long as mid coxa. Hind coxa 2.2 times as long as broad, hairy in basal part dorsally. Spur of hind tibia 0.52 length of basitarsus. Fore wing (fig. 49) 2.3 times as long as broad; costal cell 9.5 times as long as broad, upper side with a single row of setae in distal half, an interrupted row on the lower side plus a second one in the distal part; speculum open; basal cell closed with a few setae under subcostal vein; M:PM:ST= 46:9:4.

Gaster compressed; basal sternite slightly projecting beyond coxa; hypopygium projecting about 0.75 along gaster bare except for some hairs at tip. Ovipositor index 2.8, as long as metasoma plus half mesosoma. Length 2 mm.

Colour: green, slightly bluish in places. Sides of mesosoma more or less brassy; fore and middle legs testaceous, hind legs with femora brown-metallic, hind tibiae brown. Gaster darker, brownish. Wings hyaline, venation yellowish.

Male.— Unknown.

Comments.— The female of *capitonis* resembles *T. crassiceps* spec. nov. which differs mainly in having a shorter ovipositor (index 2.2); POL 2.3 OOL. M 3 times length of PM. *Torymus capitonis* resembles smaller specimens of *T. aceris* Boucek, which differs in having POL only 1.8-2.0 OOL, *aceris* also has the legs more slender, with hind femora 4.2-4.5 times as long as broad; the fore coxae are wholly yellowish, hind femur wholly yellow, rarely infusate.

Biology.— Unknown.

Distribution.— France.

*Torymus caudatulus* spec. nov.

Type material.— **Holotype**, ♀, (BMNH): "FRANCE, Cantal, SE of Col de Redondet, (4) 30.7.1973, M. de V. Graham". **Paratype**: ♀, (BMNH): "England: Middlesex, Southgate, 30.9.1964, M. de V. Graham"

Description of female.— Morphology: head in dorsal view 2.1 times as broad as long, temples 0.19-0.22 apparent length of eye, strongly converging and slightly curved. POL 2.0 OOL, OOL 1.1 OD. Vertex finely sculptured, with scattered minute punctures. Frontally seen the head is trapeziform, with straight genae. Mouth 1.7 length malar space, the latter 0.35-0.36 length of eye. Antennae with toruli well above lower eyeline, slightly nearer to clypeus than to anterior ocellus; scape 3.8 times as long as broad, reaching middle of anterior ocellus; pedicellus plus flagellum 1.17-1.28 breadth of head, flagellum proximally slightly stouter than pedicellus, moderately clavate; pedicellus 1.75 times as long as broad; anellus 1.5 times as broad as long; F1 1.15 times as long as broad, F2-F5 quadrate, F6 and F7 very slightly transverse; clava twice as long as broad; sensilla numerous, uniseriate.

Mesosoma 1.65 times longer than broad, somewhat shiny. Mesonotum 1.43 times as broad as long, sculpture fine, slightly rippled in front, punctures numerous but minute, setae short, at hind end longer, slightly raised. Scutellum 1.15 times as long as broad rounded at base, even more finely reticulate as mesonotum, punctures numerous very small, flange very narrow, distinctly trabeculate. Dorsellum nearly smooth, with a trace of a median sulcus. Propodeum finely delicately alutaceous, smoother medially with a row of small fovea at the base. Mesepimeron 1.45 times as

high as broad, about as high as length of mid coxa. Hind coxa 2.2 times as long as broad, with rather coarse, slightly raised reticulation, dorsally with about 11 setae on basal half. Spur of hind tibia 0.4-0.45 length of basitarsus. Forewing 2.3 times as long as broad, costal cell 9 times as long as broad, above with one row of setae over distal half, below with one row plus scattered hairs, except in the middle; basal cell with 2-5 setae below SM; basal vein with 4-5 setae; speculum partly open, extending slightly beyond parastigma; M:PM:ST=58:14:6.5, stigma slightly oblique, small.

Gaster short and high, slightly compressed; basal sternite projects somewhat beyond coxa; hypopygium extending three quarters along gaster, bare except tip. Ovipositor index 1.07-1.15, very slightly shorter than gaster. Length 1.9-2.2 mm.

Colour: bright green, slightly golden on sides of mesosoma. Scape yellow, darkened dorsally apically or along whole dorsal edge. Legs, including apical half of fore coxae testaceous, hind tibia slightly infuscate medially on posterior edge sometimes, fifth tarsal segment fuscous. Tegulae brownish. Wing hyaline, venation testaceous or brownish testaceous. The French specimen seems to be darker than the British one.

Male.— Unknown.

Comments.— The female seems to differ from *galii* in having a slightly shorter ovipositor (*galii* 1.6-1.9), longer malar space (*galii* 0.28-0.31), the scape is longer, reaching middle of anterior ocellus or nearly to top (in *galii* slightly longer than transverse diameter of eye and hardly reaching lower edge of ocellus), while the legs are more extensively pale (in *galii* hind femur broadly black, often other femora more or less infuscate, hind tibia usually broadly infuscate).

Biology.— Unknown.

Distribution.— France, Great Britain.

### *Torymus caudatus* Boheman, 1834

(fig. 50)

*Torymus caudatus* Boheman, 1834: 365-366, ♀; Thomson, 1876 84; Bakke, 1955: 170-174; Boucek, 1977: 25; Nikol'skaya & Zerova, 1978: 370; Sellenschlo & Wall, 1984: 23; Grissell, 1995: 277.

*Torymus distinctus* Foerster, 1840: xxx, ♂; Grissell, 1995: 279. **Syn. nov.**

Type material.— **Neotype** of *Torymus caudatus* Boheman, here designated, ♀ (ZIL), labelled as follows: "Sk [Skåne] Jularp, RN 1359/6206, 18.iv.1990, leg. C. Hansson".

*Torymus distinctus* Foerster. Original material not found.

Comments.— *Torymus caudatus* Boheman Described from a single female taken at Anneberg in Småland. Mayr (1874) had not seen the holotype. Thomson (1876) almost certainly saw it, as he corrected Mayr, who had confused it with *azureus*. His opinion is therefore taken as decisive. Graham has been unable to find this holotype in Boheman's collection (NR). He also looked in the Thomson collection (ZIL) in case it had been borrowed by Thomson and not returned, but there was no trace of it. Fresh material from Småland is not available but a series was reared in Skåne by Dr. C. Hansson. We have taken a female from this series as neotype.

*Torymus distinctus* Foerster: the description includes the words "stark behaart" and "Hinterschenkel .... etwas keulförmig", characters which do not seem to apply to the male of any European species except *caudatus*.

The best summary of the biology was given by Bakke (1955); earlier writers had mostly confused it with *azureus* Boh.

Biology.— Parasite of *Kaltenbachiella strobi* (Winnertz) in cones of *Picea*.

Distribution.— Croatia, Czech Republic, Great Britain, Hungary, Netherlands, Poland, Sweden, Switzerland, Yugoslavia.

*Torymus centor* spec. nov.

Type material.— **Holotype**, ♀, (BMNH): "England, Bucks. Hell Copice (1) 19.8.1960, M. de V. Graham". (damaged after the description).

Description of female.— Morphology: head in dorsal view 2.13 times as broad as long, temples 0.24 apparent length of eyes. POL 2.2 OOL, OOL 1.3 OD. Vertex with fine reticulation and scattered minute punctures. In frontal view the head is trapeziform, with straight genae. Mouth is 1.9 times malar space, which is 0.35 length of eye, clypeus is very slightly produced, narrowly truncate. Antenna with toruli well above lower eyeline, but slightly nearer to clypeus than to anterior ocellus; scape 3.8 times as long as broad not quite reaching anterior ocellus; pedicellus plus flagellum 1.3 times breadth of head, flagellum proximally very slightly stouter than pedicellus, moderately clavate; pedicellus twice as long as broad; anellus 1.3 times as broad as long; F1 1.25 times as long as broad, following segments quadrate, F7 slightly transverse; clava 2.1 times as long as broad; sensilla moderately numerous, uniseriate.

Mesosoma 1.9 times as long as broad. Mesonotum 1.15 times as broad as long, somewhat shiny, finely reticulate, transversely rippled-scaly, setae of average length, slightly raised, punctures numerous, very small. Scutellum 1.32 times as long as broad, with narrowly rounded base, sculpture and punctures like on mesoscutum, setae on hind third very distinctly raised, flange very narrow, with indistinct trabeculae. Dorsellum nearly smooth. Propodeum very shiny, with finely, delicate alutaceous sculpture, smooth in the middle third. Mesepimeron 1.45 times as high as broad, shorter than mid coxa (19:22.5). Fore femur with long outstanding setae ventrally, setae nearly as long as breadth of femur. Hind coxa twice as long as broad, with moderate finely, slightly raised reticulation, its hind edge strongly curved, fairly thickly hairy in basal half. Hind femur 3.5 times as long as broad. Spur of hind tibia 0.5 length of basitarsus and 1.8 times breadth of tibia, which is 7 times as long as broad. Forewing 2.3 times as long as broad; costal cell 9 times as long as broad, above with one row, below with one row plus scattered setae in basal quarter and distal third; basal cell with 2-3 setae below SM, closed; basal vein with 6 setae; speculum not extending beyond parastigma, nearly closed; M:PM:ST=70:19.5:6.5, stigma small, sub-circular.

Gaster slightly compressed; basal sternite hardly projecting beyond coxa; hypopygium extending two-thirds along gaster, bare, except tip. Ovipositor index 1.46, very slightly shorter than gaster. Length 2.5 mm.

Colour: head and mesosoma blue-green; scapus dark brown, lighter brown frontally, rest of the antenna dark brown, nearly black. Palpi and tegulae brown. Legs with coxae green, the hind coxae with golden reflections, femora dark brown with green shine, fore tibiae fuscous, hind tibiae fuscous. Wing veins brown.

Male.— Unknown.

Comments.— Near to *genisticola* which differs mainly in having a longer ovipositor index (more than 1.6), a shorter spur on hind tibia (half as long as breadth of tibia) and the less darkened tibiae.

Biology.— Unknown.

Distribution.— Great Britain.

*Torymus cerri* (Mayr, 1874)

*Syntomaspis Cerri* Mayr, 1874: 79, ♂ ♀; Askew, 1961: 188; Steffan, 1962: 188 (footnote); Sellenschlo & Wall 1984: 20, 101-102.

*Callimome cerri*; Hoffmeyer, 1930c: 236.

[*Syntomaspis notata* (Walker) Eady, 1959: 260, in part. Misidentification].

Type material.— **Lectotype** of *Syntomaspis cerri* Mayr, ♀ (NHMW), here designated, labelled "Singul März 72; collect. G. Mayr; Syn. cerri G. Mayr, Type". A part of a gall of *Andricus singularis* Mayr is pinned below. Six males and four females are here designated **paralectotypes** (NHMW).

Comments.— Mayr originally had 14 specimens. 14 mounts stand under this name (NHMW) but two specimens have been broken off, whilst a third (♀) seems to be the Tschek specimen doubtfully referred to *cerri*. Six males and four females of the remaining mounts are designated paralectotypes. The females differ from those of *notatus* in the characters noted in the key (couplet 23), which agrees with Askew's opinion (1961). Steffan (1962) thought that Askew's view should be considered seriously. The egg and larva were described by Sellenschlo & Wall (1984: 101-102).

Biology.— Parasite in galls of *Andricus singularis* Mayr and *Synophrus politus* Hartig.

Distribution.— Austria, Germany, Hungary.

*Torymus chlorocopes* Boheman, 1834  
(figs 51-53, 244)

*Torymus chlorocopes* Boheman, 1834: 377-378, ♀; Thomson, 1876: 85; Sellenschlo & Wall, 1984: 23; Grisell, 1995: 278.

*Callimome chlorocopes*; Hoffmeyer, 1930c: 238.

[*Torymus fuscipes* Boheman; Mayr, 1874: 108, in part, misidentification].

Type material.— Lectotype ♀ (NR), labelled "Sm" [Småland] and "Bhn", here designated.

Comments.— The **lectotype** is the only female standing in Boheman's collection under this name. It lacks the head and agrees with Thomson's interpretation. The ovipositor index is 2.25. Mayr (1874) placed it in synonymy with *fuscipes* Boh.

Male.— Unknown.

Biology.— Reared from galls of *Helicomomyia saliciperda* (Dufour) on *Salix*.

Distribution.— Czech Republic, Netherlands, Sweden.

*Torymus chloromerus* (Walker, 1833)  
(figs 54-59)

- Callimome chloromerus* Walker, 1833: 126, ♂ ♀.  
*Torymus chloromerus*; Boucek & Graham, 1978a: 226; Grissell, 1995: 278.  
*Callimome abdominalis* Walker, 1833: 126, ♀.  
*Callimome micropterus* Walker, 1833: 130, ♀.  
*Callimome Euphorbiae* Walker, 1833: 132, ♀.  
*Torymus cyanimus* Boheman, 1834: 367-360, ♂ ♀; Varley, 1947: 171; Sellenschlo & Wall, 1984: 24.  
*Torymus abbreviatus* Boheman, 1834: 375, ♀.  
 ?*Torymus chlorinus* Foerster, 1840: xxx, ♀.  
*Torymus hieracii* Mayr, 1874: 112, ♂ ♀.  
*Torymus campanulae* Cameron, 1880: 40, ♂ ♀. **Syn. nov.**  
*Torymus britannicus* Dalla Torre, 1898: 301.  
*Torymus tilicola* Ruschka, 1921: 337-338, ♂ ♀; Boucek & Graham, 1978a: 227; Grissell, 1995: 288. **Syn. nov.**  
*Torymus euphorbiae* Ruschka, 1921: 338, ♂ ♀.  
*Callimome centaureae* Hoffmeyer, 1930c: 241, 251, ♂ ♀. **Syn. nov.**  
*Torymus centuareae* [sic]; Grissell, 1995: 277.

Type material.— **Lectotypes** of *C. abdominalis* Walker, *C. chloromerus* Walker *C. micropterus* Walker and *C. euphorbiae* Walker, designated by Eady (1959: 263-264).

*T. cyanimus* Boh.: **lectotype**, ♀, (NR), here designated, labelled "KK [Kinnekulle]; Bhn; Type; Thoms."

**Lectotype** of *T. abbreviatus* Boh. ♀ (NR), here designated, labelled: "Nv. alp. [Norvegia alpina]; Bhn" and "*Torymus abbreviatus* Boh. M. de V. Graham det. 1959 LECTOTYPE ♀".

*T. chlorinus* Foerster: no original material seen.

*T. hieracii* Mayr: **lectotype**, ♀, (NHMW), here designated, labelled: "Collect. G. Mayr, *Tor. hieracii* G. Mayr, Type; *Aylax hierac.* Schluss."

*T. campanulae* Cameron: **lectotype**, ♀, (BMNH), here designated, labelled, in Cameron's hand, "Cec. gall on Camp. Cameron 1880"; **paralectotypes**: 1 ♀ 2 ♂ ♂ (NHMW), here designated, mounted similarly (flat) on cards and labelled in Cameron's hand.

*T. tilicola* Ruschka: **lectotype**, ♀, (NHMW), here designated, labelled: "Austr. infer. Raabs 18.7.906 Wachtl; ♀; 67; *Torymus tilicola* Ruschka Type".

*T. euphorbiae* Ruschka: **lectotype**, here designated, the left hand ♀ (NHMW), mounted with a conspecific ♀ on minutien pins stayed on a pith block. Labels: "*Cec. euphorbiae* Weidling coll. Wachtl; *T. euphorbiae* Ruschka, Type".

*C. centaureae* Hoffmeyer: **lectotype**, ♀, (ZMK) here designated, on a slide, labelled: "*Callimome centaureae* n. sp. Typer [underlined in red] Ermelund xV-VI 1907 Gallen paa *Centaurea* L.P. Kryger coll. Hoffmeyer praer. 1929".

Comments.— *C. abdominalis* Walker was synonymised by Eady (1959:263).

*C. micropterus* Walker: Eady regarded it as a distinct species. It appears to be a small form of *chloromerus* (summer-autumn generation), with which it was synonymised by Boucek and Graham (1978: 226).

*C. euphorbiae* Walker was synonymised with *cyanimus* Boh. by Eady (1959: 263).

*T. cyanimus* Boh. and *T. abbreviatus* Boh. (both synonymised by Boucek & Graham, 1978) belong to the spring generation of *chloromerus*.

*T. chlorinus* Foerster: from the description it seems possible that it is the same as *chloromerus*.

*T. hieracii* Mayr was synonymised with *cyanimus* Boh. by Eady (1959: 263) and belongs to the summer form of *chloromerus*.



*T. campanulae* Cameron: a male is in BMNH registered as Type Hym. 5.27; it is mounted flat on a card and lacks the gaster; labels: "Cameron coll. 98-220"; ;*Torymus campanulae* Cam. type ♂ Clober" [in Camerons hand]. It probably belongs to *chloromerus* (Walker). Cameron (1880) stated that some of his specimens had been examined by Mayr, who considered them to represent a new species. We conclude that the ♂ ♂ and ♀ paratypes in NHMW are those.

*Torymus britannicus* Dalla Torre is a replacement name for *C. abdominalis* Walker, nec Boheman.

*T. euphorbiae* Ruschka: synonymised by Eady (1959: 263). The here designated lectotype appears identical with the lectotype of *euphorbiae* Walker and with specimens reared in the Netherlands from galls on *Euphorbia*, by Mr. H.J. Vlug. All these specimens are extremely close to *chloromerus* (Walker), though at first Graham hesitated to regard them as conspecific. Mr. Vlug's were reared in August and, like the lectotype of *euphorbia* Ruschka, have ovipositor index 2.4-2.55. This figure extends slightly outside the otherwise observed range in the spring generation of *chloromerus* (index 2.05-2.4) and also of the summer generation (index 2.8-3.2). We conclude that the actual range of variation is more extensive and therefore confirm the synonymy of *euphorbiae* with *chloromerus*.

*T. tilicola* Ruschka is an extreme dwarf of *chloromerus*.

*C. centaureae* Hoffmeyer: we studied the lectotype and consider it conspecific with *chloromerus*.

Biology.— Parasite of a wide range of hosts, Cecidomyiidae Tephritidae and Cynipidae on herbaceous plants as well as on trees. Among these are: *Aulacidea hieracii* (Bouché), *Dasineura mali* (Kieffer), *D. symphyti* (Rübsamen), *D. violae* (Löw), *D. sysimbrii* (Schrank), *Bayeria capitigena* (Bremi).

Distribution.— A common species in Europe.

*Torymus chrysocephalus* Boheman, 1834  
(figs 60-61, 245)

*Torymus chrysocephalus* Boheman, 1834: 340-342, ♀; Mayr, 1874: 89; Grissell, 1995: 278.  
*Callimomus chrysocephalus*; Thomson, 1876: 79; c, 1930: 235.

Type material.— **Lectotype** of *Torymus chrysocephalus*, ♀, (NR): here designated, "Sm" [Småland] and "Bhn".

Comments.— There are five specimens in Boheman's collection, but two bear a wrong locality. In the lectotype the flagellum of the left antenna is missing, also the ovipositor sheaths (the ovipositor itself is present).

Thomson (1876: 78) pointed out that the male attributed to *chrysocephalus* by Mayr (1874: 89) really belonged to *igniceps* Mayr.

Cameron (1901: 272) recorded *chrysocephalus* from Bishopton [Scotland, near Renfrew]. His material has not been located but the record may be correct.

Biology.— Unknown.

Distribution.— Wales, Scotland, Sweden.

*Torymus cingulatus* Nees, 1834  
(fig. 62)

*Torymus cingulatus* Nees, 1834: 62, ♀; Grissell, 1995: 278.

*Torymus aeneus* Nees, 1834: 64-65, ♀. **Syn. nov.**

*Torymus medius* Foerster, 1840: xxix-xxx, ♀. **Syn. nov.**

*Torymus Glechomae* Mayr, 1874: 90, ♂ ♀. **Syn. nov.**

*Torymus glechomae*; Nikol'skaya & Zerova, 1978: 370; Sellenschlo & Wall, 1984: 25.

Type material.— *Torymus cingulatus* Nees. **Lectotype**, ♀, (OUM): designated by Graham (1969: 66), labelled 6; 5. 1, Jun. 08 [in Nees' hand]; *Torymus cingulatus* Es. [Westwood's hand]; Graham lectotype label.

*Torymus aeneus* Nees: holotype ♀, destroyed.

*Torymus medius* Foerster: original material not located. The description suggests that it may have been conspecific with *cingulatus* Nees.

*Torymus glechomae* Mayr: **lectotype**, ♀, (NHMW): here designated, mounted on a pith block with a male, labelled "Collect. G. Mayr; *Tor. Glechomae* Fö. det. G. Mayr; Aus *Glechoma* Bozen März 73".

Comments.— *Torymus glechomae* Mayr: there are one male and four female syntypes in NHMW, in the description Mayr mentioned: "Austria, Burg Sigmundskron near Bozen, reared March 1873 from galls of *Aylax glechomae*".

Grissell (1976: 28-29) suggested doubtfully that *Torymus glechomae* Mayr, 1874 might be a synonym of *Callimome flavicoxa* Osten Sacken, 1870. Graham has examined three females determined by Grissell as *flavicoxa* (BMNH), reared from galls of *Diplol-epis terrigena* on *Rosa californica*. They are near to but not conspecific with *cingulatus* Nees, differing in having the malar space slightly longer [0.24-0.30 length of eye in *cingulatus* ) and antennal anellus obviously broader than long [nearly quadrate in *cingulatus* ). In addition, the host records for *flavicoxa* seem likely to be significant, as the species associated with *Rosa* appear to be fairly host-specific and probably not likely to have an alternate host on *Glechoma*. We conclude that Grissell's doubt was justified.

Biology.— Reared from galls of *Liposthenus latreillei* (Kieffer) (Hym. Cynipidae) on *Glechoma hederacea*.

Distribution.— Austria, Czech Republic, Great Britain, Italy, Netherlands.

*Torymus confinis* (Walker, 1833)  
(fig. 63)

*Callimome confinis* Walker, 1833: 125, ♀.

*Torymus confinis*; Grissell, 1995: 278.

*Callimome curtus* Walker, 1833: 131, ♀.

*Callimome inconspicua* Walker, 1833: 133, ♂.

*Cynips urticae* Perris, 1840: 404, ♂ ♀.

*Torymus urticae*; Mayr, 1874: 123; Eady, 1959: 264; Sellenschlo & Wall, 1984: 28; Boucek, 1977: 27; Grissell, 1995: 289.

Type material.— The **lectotypes** of *Callimome confinis* (♀, BMNH Type Hym. 5. 1573), *C. curtus* Walker (♀, BMNH Type Hym. 5. 1589) and *C. inconspicua* Walker (♂, BMNH Type Hym. 5. 1593) were designated by Eady (1959: 264). Location of type material of *Cynips urticae* Perris, if extant, not known.

Comments.— *Cynips urticae* Perris: described from reared material collected in France near Mont-de-Marsan (Landes). From the brief description and the recorded host, the species can be recognised.

Biology.— Reared from galls of *Dasineura urticae* (Perris) (Dipt. Cecidomyiidae) on *Urtica dioica*

Distribution.— Austria, France, Germany, Great Britain, Netherlands, Yugoslavia (Serbia).

*Torymus corni* Mayr, 1874  
(fig. 64)

*Torymus Corni* Mayr, 1874: 121, ♂ ♀; Sellenschlo & Wall, 1984: 24; Grissell, 1995: 279.  
*Callimome corni*; Hoffmeyer, 1930c: 242.

Type material.— **Lectotype**, ♀, (NHMW): here designated, pinned on a pith block, labelled "Collect. G. Mayr; Bohr. er-reicht bei Puppe nicht d. Basis des Abd; Leop-bg 11.10.73 gesamt Fl. Dec. 73"

Comments.— The abbreviation "Leop-bg" stands for Leopold Berg, in Mayr's time just north of Vienna. Mayr (1874: 121) stated that he had collected his material "bei Wien".

Biology.— Reared from galls of *Craneiobia corni* (Giraud) (Dipt., Cecidomyiidae) on leaves of *Cornus sanguinea*.

Distribution.— Austria, France, Great Britain.

*Torymus crassiceps* spec. nov.  
(figs 65-67)

[*Torymus contubernalis* Boheman; Thomson, 1876: 96. Misidentification]

Type material.— **Holotype**, ♀, (NR): "Bh [Bohuslän] Bhn [Boheman] Type Thoms.", standing in Bohemans series of *T. contubernalis*.

Description of female.— Morphology: head in dorsal view (fig. 65) 1.8 times as broad as long; temples 0.37 apparent length of eye, strongly rounded; POL 2.3 OOL, OOL 1.1 OD. Vertex with fine reticulation and scattered minute piliferous punctures. Head in front view subtrapeziform, with genae very slightly curved. Eyes 1.35 times as long as broad, separated by 1.1 times their length. Face moderately thickly clothed with rather short white setae. Genae behind malar sulcus nearly smooth. Mouth 2.35 times malar space, the latter 0.37 length of eye. Anterior margin of clypeus slightly produced and curved. Antenna (fig. 67): toruli placed very well above ventral edge of eyes; length of scape nearly equal to transverse diameter of eye, not reaching anterior ocellus; pedicellus plus flagellum 1.35 breadth of head, flagellum proximally hardly stouter than pedicellus, thickening moderately distad; pedicellus 1.8 times as long as broad, about 1.3 times as long as F1; anellus nearly quadrate; F1-F5 quadrate, F6 and F7 very slightly transverse; clava twice as long as broad, nearly as long as F5+F6+F7; sensilla numerous, uniseriate.

Mesosoma moderately arched dorsally, propodeum sloping at 45°. Mesoscutum

1.5 times as broad as long, with excessively fine reticulation; notauli not deep; piliferous punctures minute. Scutellum 1.3 times as long as broad, rounded at base, sculpture and punctures like mesoscutum, flange very narrow, finely trabeculate. Dorsellum nearly smooth. Propodeum extremely finely and delicately alutaceous; row of fovea along base very small; spiracles about 1.6 times as long as broad, about twice their length from hind margin. Hind leg with coxa about 2.3 times as long as broad, externally with moderate fine, slightly raised reticulation; hind margin strongly curved; dorsal surface rather sparsely pilose in basal half; femur four times as long as broad; spur of tibia 0.47 length of basitarsus. Forewing 2.25 times as long as broad; costal cell (fig. 66) about eight times as long as broad, upper surface with a complete row of setae, lower surface with a complete row plus scattered setae in proximal quarter and distal third; M:PM:ST=36:11:4, stigma (fig. 66) shortly petiolate; basal cell with three setae below SM, closed with 5 setae distad; basal vein with 4-5 setae; speculum closed below except in proximal third, extending below the parastigma, thence as an extremely narrow strip which hardly reaches ST; wing just beyond speculum rather sparsely setose, but more thickly distad.

Gaster slightly compressed; basal sternite extending somewhat beyond apex of hind coxa; hypopygium at three-quarters, bare except for a few setae at tip. Ovipositor index 2.2, sheaths as long as metasoma plus nearly half mesosoma.

Male.— Unknown.

Comments.— Thomson's statement (1876: 96) under his description of supposed *contubernalis* "terebra abdomine parum longiore" shows that he did not see Boheman's species which was described as having the ovipositor as long as the body. On the other hand his reference "capito haud transverso, genis buccatis, vertice transversus convexo, sat lato, ocellis fere in triangulum disposito" apply exactly to *crassiceps* spec. nov. Thomson probably based his concept of *contubernalis* on the female specimen in Boheman's collection, the only specimen with a Thomson label in the series.

Biology.— Unknown.

Distribution.— Sweden.

*Torymus cretaceus* spec. nov.

Type material.— **Holotype**, ♀, (BMNH): Italy "N. Italy. Dolomites, Seis am Schlern, 1-13 vi. 1964".  
**Paratype**: ♀, (BMNH): same data as holotype.

Description of female.— Morphology: head in dorsal view 2.3 times as broad as long; temples 0.19 length of eyes, strongly convex and curved; POL 2.05 00L, 00L 1.1 OD. Vertex extremely finely reticulate, with a number of small punctures. In frontal view the mouth is 1.8-1.85 times malar space, the latter 0.34-0.36 length of eye. Genae straight. Clypeus slightly produced, curved. Antennae with toruli well above lower eyeline; scape 4.5 times as long as broad; pedicellus about 1.5 times as long as broad; pedicellus plus flagellum 1 2 times breadth of head; flagellum proximally slightly stouter than pedicellus, moderately clavate; F1 1.3 times as long as broad, F2-F5 quadrate, F6 and F7 slightly transverse; clava about 1.9 times as long as broad; sensilla numerous, uniseriate.

Mesosoma nearly 1.7 times as long as broad. Propodeum sloping at an angle of about 45°. Mesoscutum 1.4 times as broad as long, finely reticulate but more scaly in frontal part, punctures numerous, minute. Scutellum 1.4 times as long as broad, sculptured as mesoscutum, rounded at base, punctures small, separated twice their diameter, flange narrow, finely but distinctly trabeculate. Dorsellum smooth with a trace of a sulcus. Propodeum with very fine superficial reticulation. Mesepimeron about as long as high, 0.75 shorter than mid coxa. Hind coxa twice as long as broad, with rather coarse raised reticulation, the hind edge strongly curved and with thick pilosity over basal half. Spur of hind tibia 0.4 times length of basitarsus. Hind wing 2.2 times as long as broad; costal cell about ten times as long as broad, above with one row of setae which is broken medially, underside with one row plus some scattered setae in the middle; basal cell with a row of hairs below SM, closed below; basal vein with five setae; speculum rather small, extending beyond parastigma, partly open; relative lengths of wing veins are M:PM:ST = 62:15:6.2; stigma nearly sessile, small.

Gaster only slightly compressed, basal sternite hardly extending beyond coxa; hypopygium at about 0.75 length of gaster, bare, except tip, which has a few hairs. Ovipositor index 1.46-1.55. Length 2.0-2.2 mm.

Colour: body bright green, with golden tinge in places; in paratype face and sides of mesosoma coppery. Palpi testaceous. Antennae black; scape yellow with dorsal edge fuscous. Fore coxae partly to mainly yellow; mid and hind coxae coloured like mesosoma; legs otherwise yellowish-testaceous with posterior edge slightly darker. Wings hyaline with testaceous venation.

Male.— Unknown.

Comments.— The female of *cretaceus* differs from *T. ruschkai* by the length of the ovipositor index 1.46-1.55 (in *ruschkai* 1.9), the mouth is 1.80-1.85 times malar space (in *ruschkai* slightly less than 0.8 and respectively.). Genae, just behind malar sulcus are distinctly alutaceous, without or with at most a very narrow smooth area. Legs, including 1/3-1/2 of fore coxae, yellowish-testaceous; or at most hind femur and tibia slightly darkened. *cretaceus* differs from *caudatulus* spec. nov. in having a slightly longer ovipositor, and a slightly shorter malar space.

Biology.— Unknown.

Distribution.— Italy.

*Torymus cultratus* spec. nov.

Type material.— **Holotype**, ♀, (BMNH): "Turkey: Kütahya Murat Dagi. 1700 m. 31.vii.1962. Guichard & Harvey. BM 1962-299".

Female.— Resembles that of *arcella* spec. nov. in having tip of hypopygium nearly level with apex of gaster. It differs from it as follows: Ovipositor index 2.65, sheaths as long as metasoma plus half mesosoma. Temples slightly longer (0.25 length of eyes). Malar space slightly longer, 0.4 length of eye. Sculpture of mesonotum over anterior two-thirds, tending to be transversely rippled-scaly. Length 2.75 mm.

Colour: body bright green, more golden-green on genae and parts of mesosomal pleuron. All coxae dark. Hind femur mainly black; fore femur with black dorsal stripe, mid femur with dark median ring.

Male.— Unknown.

Comments.— *T. cultratus* also resembles some females of the summer form of *T. chloromerus*. The female *chloromerus* of comparable size differs in having tip of hypopygium at or slightly beyond 0.75 length of gaster, ovipositor sheaths as long as metasoma plus mesosoma, pedicellus plus flagellum about 1.35 breadth of head, pedicellus slightly shorter relative to its breadth.

Biology.— Unknown.

Distribution.— Turkey (Asia Minor). The species may occur in nearby countries as well.

*Torymus cultriventris* Ratzeburg, 1844  
(figs 68-69, 246)

*Torymus cultriventris* Ratzeburg, 1844: 179, ♀; Mayr, 1874: 61-62; Thomson, 1876: 100 (note); Dziurzynski, 1961; Boucek, 1977: 25; Sellenschlo & Wall, 1984: 24; Grissell, 1995: 279.

*Callimome cultriventris*; Hoffmeyer, 1930c: 241.

[*Torymus Nördlinger*; Mayr, 1874: 113. Misidentification].

Type material.— Types are not designated yet.

Comments.— Ratzeburg's original material was reared by Saxesen from beech-leaf galls (clearly those of *Mikiola fagi*). Boucek (1964: 670) found 2 females and one male in the remnants of Ratzeburg's collection in Eberswalde, labelled "*Tipula Fagi*" and "*cultri-ventris* R.". He was not sure if these represented original material. In RMNH, Leiden there is a card-pointed female labelled "Rtz."; "Ratz. Mayr Germ."; "Cat. No.2"; "Museum Leiden *Torymus cultriventris* Ratz.". Mayr (1874: 114) who stated that he had seen Ratzeburg types, should be taken as first reviser. We see no reason why the specimens in Eberswalde should not be original material; a lectotype could be selected from the two females. The specimen in Leiden is *cultriventris* as generally understood. There is no problem concerning the identity of this species.

Biology.— Reared from galls of *Mikiola fagi* (Hartig) on *Fagus*. A parasite of *Aprostocetus elongatus* (Foerster) according to Dziurzynski, 1961.

Distribution.— Croatia, Czech Republic, Germany, Great Britain, Netherlands, Poland, Slovakia, Yugoslavia.

*Torymus cupratus* Boheman, 1834  
(figs 70-73)

*Torymus cupratus* Boheman, 1834: 375-377, ♂ ♀; Thomson, 1876: 90; Sellenschlo & Wall, 1984: 24 (Swedish record only); Grissell, 1995: 279.

Type material.— **Lectotype**, ♀, (NR): here designated, labelled: "Dv" [Dovre]; "Bhn"; "Type".

Comments.— Boheman (1834: 376) stated that *cupratus* was taken in Norway ("ad Leidalsören") on 26 August 1832. Thomson (1876: 90) said that Boheman had taken *cupratus* at Dovre. We cannot trace Leidalsören as such, but Boheman is known to have collected many Ichneumonoidea in the Dovre area, so we accept Thomson's

statement. Probably Laerdalsøyri, on the southern shore of Lardalsfjorden, about 150 km SW of Dovre, is the place in question [Lardalsören on some old maps]. Boheman served as an army officer and made many collecting trips in his spare time.

There are six specimens under *cupratus* in Boheman's collection (NR) but some are from the wrong localities. *T. cupratus* appears to be a rare, probably northern species. Graham made full notes on the lectotype, upon which our identification is based.

Male.— Unknown.

Biology.— Unknown.

Distribution.— Great Britain, Norway.

*Torymus cupreus* (Spinola, 1808)

*Diplolepis cuprea* Spinola, 1808: 212-213, Pl. III, fig. XI, ♀.

*Torymus cupreus* Nees, 1834: 67, 69.

*Diomorus cupreus*; Steffan, 1952; Erdős, 1960: 40; Boucek, 1977: 19; Nikol'skaya & Zerova, 1978: 368; Sellenschlo & Wall, 1984: 29; Graham, 1992a: 112,113; Grissell, 1995: 185.

*Diomorus Kollari* Foerster, 1859: 102, ♀; Giraud, 1866: 443-500; Mayr, 1874: 73-74; Enslin, 1922: 12-14; Hoffmeyer, 1930: 254.

Type material.— *Diplolepis cuprea* Spinola: original material not found. The drawing leaves no doubt that this is the species currently understood as *Diomorus cupreus* Spinola.

*Torymus cupreus* Nees: original material lost.

*Diomorus Kollari* Foerster: original material not found.

Comments.— *Torymus cupreus* Nees: synonymised by Steffan, 1952b: 293. Nees himself guessed that this species may be identical with *T. dentipes* Dalman (which is a *Monodontomerus*) and with *Diplolepis cuprea* Spinola. Under *T. calcaratus* he mentioned the similarity between that species and *cupreus*.

*Diomorus kollari* Foerster: synonymised by Steffan, 1952b: 293. Under this name Enslin (1922) described immature stages.

Biology.— Parasite of Sphecidae and Apidae (Hym.).

Distribution.— Mostly in southern parts and middle of Europe, just reaching the Netherlands.

*Torymus curticauda* spec. nov.  
(figs 74-75)

Type material.— **Holotype**, ♀, (BMNH): Great Britain: "Hell Coppice nr. Oakley, Bucks., 14.vi.1958, M.W. Graham". **Paratypes**: 2 ♂♂, 1 ♀, (BMNH): 14.vi.1958, 1 ♀ (MJG), 24.vi.1958, 1 ♀ (BMNH), 17.vii.1962, topotypic; 1 ♀ (BMNH), "Wales: Pembr. Cenarth 22.vi.1977 Noyes & Boucek. Brit. mus. 1977-308"; Czech Republic, 1 ♀ (BMNH), "Bohemia Brehyne raseliny 10.vii.1954 A. Hoffer"; 1 ♀ (RMNH) "Netherlands NB. Udenhout "De Brand" 14-21.VII.1990 Ins. WG. Tilburg RMNH".

Description of female.— Morphology: head in dorsal view (fig. 74) twice as broad as long and 1.15 times as broad as mesoscutum; temples about 0.15 apparent length of eyes, converging strongly, curved. POL 1.4-1.55 OOL, OOL 1.6-1.8 OD. Eyes 1.25 times as long as broad, separated by their own length. Vertex excessively finely reticulate, with scattered minute punctures. Head in front view trapeziform, genae nearly

straight. Mouth 1.8 malar space, the latter 0.37 length of eye. Anterior margin of clypeus not produced, virtually straight. Antenna (fig. 75): toruli situated above ventral edge of eyes, but slightly nearer to anterior margin of clypeus than to anterior ocellus; scape length about 0.66 length of eye and distinctly less than breadth of eye, not nearly reaching anterior ocellus; pedicellus plus flagellum hardly 1.2 times breadth of head, flagellum proximally not stouter than pedicellus but thickening moderately distad; pedicellus about 1.65 times as long as broad, nearly twice as long as F1; anellus somewhat broader than long; F1 quadrate or hardly longer than broad, tending to be slightly shorter than F2, following segments quadrate, or F7 very slightly transverse; clava nearly twice as long as broad, nearly as long as F7+F6+F5; sensilla sparse, uniseriate.

Mesosoma 1.9 times as long as broad, moderately arched dorsally. Propodeum sloping at 40 degrees. Mesoscutum nearly 1.5 times as broad as long, very finely reticulate; notauli rather shallow; piliferous punctures very small, separated on average by about twice their diameter; setae slightly raised, rather short. Scutellum 1.25 times as long as broad, very finely reticulate, its base rounded; piliferous punctures a little longer than those of mesoscutum; setae of posterior third longer and very distinctly raised, flange very narrow, not distinctly trabeculate. Dorsellum very finely reticulate. Propodeum including callus with fine superficial alutaceous sculpture, with a row of very small foveae along its base; spiracles small, about 1.3 times as long as broad, about 2.5 times their length from posterior margin. Mesepimeron less high than mid coxa (16:20), about 1.2 times as high as broad. Hind leg with coxa twice as long as broad, its hind margin strongly curved; bare dorsally in basal half; external surface with rather coarse, slightly raised reticulation, femur about 3.3 times as long as broad, longer spur of tibia 0.5 length of basitarsus. Wing 2.4 times as long as broad; costal cell 8-10 times as long as broad, its upper surface with a complete row of setae, lower surface with a complete row plus scattered setae in basal 0.25 and distal 0.33; M:PM:ST=44:11:5, ST moderately oblique, stigma shortly petiolate, small; basal cell with a few setae in upper part, nearly closed below; basal vein with 4-7 setae; speculum moderate-sized, partly open below, extending below M for about one third length of the vein, thence as a narrow tapering strip to ST; wing just beyond speculum somewhat sparsely setose, distally more thickly.

Gaster ovate, somewhat shorter and narrower than mesosoma, slightly flattened dorsally; basal sternite extending somewhat beyond tip of hind coxa; posterior margin of tergite 4 shallowly emarginate; hypopygium bare except for a few setae at tip, which is situated at about 0.75 length of gaster. Ovipositor index 0.85-1.0, sheaths about 0.7 length of gaster. Length 1.8-2.0 mm.

Colour: body blue-green to green. Antennae black; scape testaceous beneath, or wholly so except dorsally. Coxae, and hind femora except their tips, coloured like the body; fore and mid femora black with tips broadly pale; hind tibiae broadly fuscous to black medially; legs otherwise testaceous, with tips of tarsi brown. Tegulae testaceous, with hind margin often fuscous. Wings hyaline, venation testaceous.

Description of male. Differs from female as follows:

Morphology: antenna: pedicellus plus flagellum about 1.35 breadth of head; pedicellus about 1.5 times as long as broad, slightly longer than F1; flagellum proximally stouter than pedicellus, thickening slightly distad; funicular segments quadrate, F1 a



little shorter than the others; flagellum thickly clothed with curved fuscous setae. Hind femora 3.5-3.7 times as long as broad. Gaster oval, narrower and much shorter than mesosoma.

Colour: antennal scape black, or at most the radícula pale.

Comments.— Morphologically *T. curticauda* is near to *T. amurensis* (Walker), which has (in females) temples slightly longer, ratio POL:OOL greater, OOL at most 1.5 OD, forewings slightly broader, posterior margin of tergite 4 more deeply emarginate, ovipositor index 1.1-1.3. In colour, *T. amurensis* differs in having the legs on average paler, fore coxae sometimes partly yellow, fore and mid femora yellow or only partly infuscate, hind femora less heavily infuscate, hind tibiae less strongly infuscate or wholly testaceous.

In general aspect, the female *T. curticauda* also resembles that of *pascuorum* Bouček, which differs in having some setae on the dorsal surface of the hind coxa, temples longer, ratio POL:OOL greater, mesosoma less elongate.

Biology.— Unknown.

Distribution.— Czech Republic, Great Britain (including Wales), Netherlands.

*Torymus curtisi* nom. nov.  
(fig. 76)

*Callimome Daudi* Curtis, 1835, folio 552, ♀ (preoccupied by *Callimome Daudi* (Curtis MS) Walker, 1833: 124-125, ♀).

*Torymus dauci*; Mayr, 1874: 118-119.

Type material.— *Callimome dauci* Curtis, 1835: **lectotype**, ♀, (MVMA.; “*Callimome dauci* Curtis, M. de V. Graham det., Lectotype”; “1 ♂ 3 ♀ bred by J.C.”. [label at side of series, Curtis’ hand]. **Paralectotypes**: 1 ♂, 2 ♀, (MVMA): same data as holotype.

Description of female.— Morphology: head in dorsal view 2.18-2.2 times as broad as long, temples 0.21-0.23 apparent length of eyes. POL 2.3-2.5 OOL, OOL about 1.2 OD. Vertex with fine, rather irregular reticulation, with a number of small but distinct punctures. In frontal view the head is trapeziform with straight genae. Mouth 1.85-1.9 times as long as malar space, the latter 0.36-0.37 length of eye. Clypeus weakly curved, almost truncate. Antenna: toruli distinctly above eyes; length of pedicellus plus flagellum 1.05-1.1 times breadth of head, flagellum proximally slightly stouter than pedicellus, strongly clavate; scape 3.5 times as long as broad, not or hardly reaching anterior ocellus; pedicellus 1.6 times as long as broad; anellus 1.5 times as broad as long; F1 quadrate, F2 subquadrate, F3-F6 slightly transverse, F7 1.25-1.5 times as broad as long; clava 1.7 times as long as broad; sensilla numerous, uniseriate.

Mesosoma 1.75 times as long as broad. Mesonotum 1.2 times as broad as long, extremely finely, mostly scaly reticulate, punctures minute, widely separated, setae slightly raised. Scutellum 1.2 times as long as broad, with rounded base, sculpture as on mesoscutum, but punctures smaller and setae longer especially posteriorly, flange narrow, but distinctly trabeculate. Dorsellum weakly reticulate or nearly smooth with a trace of a median sulcus. Propodeum shiny, delicately, somewhat striate alutaceous slightly smoother medially, with a row of small fovea near base. Mesepimeron 1.7 times higher than broad, shorter than length of mid coxa (15:22). Hind coxae twice as

long as broad, with rather coarse, slightly raised reticulation, its hind edge strongly curved, pilose; hind femur four times as long as broad; spur of hind tibia 0.41 length of basitarsus. Forewing 2.3 times as long as broad; costal cell 7 times as long as broad, upper side bare except for a few setae over distal third or at apex only, underside with one row plus scattered setae in basal and distal quarter; M:PM:ST=35:9:3.2, stigma shortly petiolate or subsessile, very small. Basal cell bare, closed below distally, basal vein with 1-6 setae; speculum extending beyond parastigma, partly or mainly open below.

Gaster (fig. 76) only slightly compressed, tergites 1-4 incised; basal sternite slightly longer than coxa; hypopygium extending 0.75 along gaster, bare except tip. Ovipositor index 1.75-1.9, as long as metasoma plus one-third mesosoma. Length 2.6-3.1 mm.

Colour: body bright green (sometimes partly golden-green to blue-green. Scape testaceous, more or less metallic, infuscate dorsally, rest dark. black. Coxae, and femora except tips, like body. Hind tibiae blackish except base and apex, rest yellow, mid and hind tarsi whitish-yellow proximally, 5th segments of all tarsi fuscous. Tegulae yellow with posterior edge dark. Wings hyaline, venation yellowish.

Male: differs from female: antenna scape 3.2 times as long as broad, outer surface with excessively fine granulate reticulation and not nearly reaching anterior ocellus. Pedicellus plus flagellum 1.15 times breadth of head, flagellum stouter, anellus more strongly transverse, F1 subquadrate, rest at least very slightly transverse, flagellum thickly clothed with short, curved dark setae. Antennal scape metallic black, only radícula pale. Mid tibiae sometimes more or less infuscate. Posterior two-third of gaster bronzy. Length 2.2-2.6 mm.

Comments.— Walker (1833: 124-125) described what he supposed to be *dauci* Curtis from material which he had collected on oak-trees at Southgate. According to the lectotype designated by Eady this belongs to *T. auratus* (now *flavipes*) (q.v.). Curtis had not then published his name *dauci* but Walker had advance information about it when he mentioned in his account (1833: 125).

In 1977 Graham examined the material standing under the name *Callimome dauci* in the Curtis collection (MVMA). It includes five specimens named by Walker, swept material and not syntypes. Four others, 1 male and three females are clearly syntypes. They stand beside a label in Curtis' hand "1 ♂ 3 ♀ bred by J.C.". Each specimen is pinned upon a small silver pin. Graham selected one female as lectotype of *Callimome dauci* Curtis and so labelled it; the selection is here validated. The present diagnosis of *curtisi* spec. nov. is drawn from the syntypes above and from recently reared material. Mayr (1874: 118-119) correctly interpreted Curtis' species. The female of *curtisi* is extremely close to that of *socius* Mayr, differing principally in its longer ovipositor.

Biology.— Reared from galls of *Kiefferia pimpinellae* (Löw) (Dipt. Cecidomyiidae) on *Pimpinella saxifraga*, *Pastinaca sativa*, *Daucus carota*.

Distribution.— Austria, France, Great Britain (incl. Isle of Wight and Channel Islands).

*Torymus curvatulus* spec. nov.

Type material.— **Holotype**, ♀, (RMNH): "Langbroek 10-19.iv.1972 W.C. Nijveldt, /takgal op *Salix* coll. 16.iii.1972".

Description of female.— Morphology: head in dorsal view 1.9 times as broad as long, temples 0.33 apparent length of eye, rounded. POL 2.0 OOL, OOL as long as OD. Vertex finely reticulate, with few minute and inconspicuous punctures. In frontal view the head is rounded with distinctly curved genae. Mouth 2.0 times malar space, the latter 0.36 length of eye; the clypeus is truncate. Antennae with toruli well above lower eyeline, distinctly nearer to clypeus than to anterior ocellus; scape about 3.5 times as long as broad, not reaching ocellus; pedicellus plus flagellum 1.3 times longer than breadth of head, flagellum proximally slightly broader as pedicellus, slightly clavate; pedicellus 1.8 times as long as broad; anellus transverse; proximal funicle segments quadrate, F7 0.8 times as long as broad; sensilla sparse.

Mesosoma twice as long as broad. Mesoscutum 1.15 times as broad as long finely sculptured, in front half more scaly rippled; piliferous punctures scarce and small, separated by twice their diameter or more, setae long, raised. Scutellum 1.2 times as long as broad, its base rounded, sculptured as on hinder part of mesoscutum, with punctures larger than those on mesoscutum, setae on hinder half longer and more raised, flange very narrow, finely trabeculate. Dorsellum nearly smooth. Propodeum very finely delicately alutaceous, smooth medially, with a row of small fovea basally. Mesepimeron 1.3 times longer than broad and 0.8 times as long as mid coxa. Hind leg with coxa hairy and moderately curved with rather coarse reticulation, hind femur 4.7 times as long as broad, spur of tibia 0.4 length of basitarsus and slightly longer than breadth of hind tibia. Forewing: costal cell on upper side with one row of setae, the lower side has two rows plus scattered setae distad; basal cell with 2 setae below SM, closed; basal vein with 4 setae; speculum extending distinctly beyond parastigma, with some scattered setae on lower surface in upper half, nearly closed below, wing beyond speculum moderately pilose; M:PM:ST=50:11:5, ST is shortly petiolate, slightly oblique.

Gaster slightly compressed, basal sternite projects hardly beyond hind coxa; hypopygium extending along three-quarters of gaster or slightly more, bare. Ovipositor as long as metasoma plus half of mesosoma, index 2.5. Length 2 mm.

Colour: head and mesosoma blue-green, scape testaceous, brown dorsally, tegulae yellow with a brown spot, palpi yellow; legs, except middle and hind coxae, which are green, testaceous; fore coxae with a green spot, hind femora with a greenish streak Gaster violet-blue with greenish tinge.

Male.— Unknown.

Comments.— The species can be distinguished from the other species, which are associated with *Salix* by the combination of a strongly curved malar space, the longer ovipositor, the testaceous legs and the hairy hind coxae.

Biology.— Reared from a gall on a branch of *Salix*.

Distribution.— Netherlands.

*Torymus cyaneus* Walker, 1847  
(figs 77-80, 247)

[*Torymus cyaneus*; Boheman, 1834: 366. Misidentification].

*Torymus cyaneus* Walker, 1847: 227, ♂ ♀; Boucek, 1977: 25; Boucek & Graham, 1978a: 226; Grissell, 1995: 279.

*Syntomaspis cyanea*; Askew, 1961: 184-185; Nikol'skaya & Zerova, 1978: 369; Sellenschlo & Wall, 1984: 20, 102.

*Callimome eurynotus* Walker, 1850: 126, ♂.

*Syntomaspis eurynotus* Foerster, 1859: 99-100, ♂ ♀. Preoccupied by *eurynotus* Walker, 1850.

*Syntomaspis lazulinus* Foerster, 1859: 100-101, ♂ ♀; Askew, 1961: 185, **syn. nov.**

*Torymus lazulinus*; Grissell, 1995: 283.

Type material.— *Torymus cyaneus* Walker: described from Austrian material sent by Kollar to F.W. Hope. Original material not found.

*Callimome eurynotus* Walker: one ♂ (BMNH) with labels (1) "*Torymus eurynotus* Foerst. Aachen" [in Foerster's hand]; (2) "46/16"; (3) "♂ HOLOTYPE *Torymus eurynotus* Walk. 50 det Z. Boucek". Here designated as **holotype**.

*Syntomaspis eurynotus* Foerster: Foerster evidently sent a specimen of this species to Walker, who described it, indicating that it was a manuscript name.

*Syntomaspis lazulinus* Foerster: in 1960 Graham examined 6 ♂♂ and 6 ♀♀ standing under this name in NHMW none being original Foerster material. Therefore a lectotype could not be selected.

Comments.— *Torymus cyaneus* sensu Boheman is a misinterpretation of *Ichneumon cyaneus* Fabricius, which is *Perilampus ruficornis* (Fabricius 1793) according to Steffan (1952a).

*Syntomaspis eurynotus* Foerster: Foerster said that he had reared this species many times from "holzigen Gallen von *Cynips corticis* Hart. und aus überwinterten Gallen von *Cynips quercus inferus* L.". In RMNH stands a female, sent by Foerster to Snellen van Vollenhoven. It belongs to the forma *lazulinus*.

*Syntomaspis lazulinus* Foerster: reared originally from pea-sized galls on *Quercus pubescens* (probably those of *Diplolepis disticha*). Following Mayr (1874: 80), Askew (1961: 185) regarded *lazulinus* as specifically different from *cyaneus*, on the basis of different length of ovipositor and the colour of the body. The distinction of ovipositor length seems to hold up (see couplet 17 of key) but the colour of the body is very variable. In nominotypical *cyaneus* the body is blue-green to greenish-blue, the gaster sometimes partly violet. In *lazulinus* the gaster is always partly to wholly violet, the head and mesosoma often more or less so; but we have reared a number of females which have no trace of violet on head and mesosoma. No material agreeing with *lazulinus* has been recorded from Britain or Scandinavia, though in southern France and Central Europe both *lazulinus* and *cyaneus* appear to be equally common. In RMNH stands 1 female labelled "v. Voll, Haag" [Snellen van Vollelhoven, The Hague] without date with a gall of *Diplolepis disticha*, which is fa *lazulina*. It is the only specimen of this form ever seen in The Netherlands. Adults of the form *cyaneus* may be found from May until early July, or even earlier on the Continent. Adults of *lazulinus* appear to be most frequent in July and August, though Mayr recorded single specimens in May and June. The only valid distinction between the two forms is the relative length of the ovipositor. This suggests that the two might be seasonal forms of one species, similar to those of *flavipes* (Walker). If so, *cyaneus* must be single-brooded in the North of Europe but bivoltine in Central and Southern Europe, Further rearing is necessary to elucidate fully the annual cycle. There is another complication provided by *T. macrurus* (Foerster) (see excluded species).

Biology.— Reared from different oak galls. Askew (1961: 184-185) gives an account of the biology of this species.

Distribution.— Austria, Belgium, Croatia, Czech Republic, France, Germany, Great Britain, Hungary, Netherlands, Slovakia, Sweden.

Morphological characters of larvae are described by Sellenschlo (1984a: 460). Eggs and larvae are described by Sellenschlo & Wall (1984: 102).

*Torymus cyprianus* spec. nov.  
(figs 81-82)

Type material.— **Holotype**, ♀ (BMNH): "Cyprus: Para Pedi, 14. viii. 1937, G.A. Mavroumoustakis, BM. 1937-808".

Description of female.— Morphology: head in dorsal view (fig. 81) twice as broad as long; temples 0.22 length of eyes, converging moderately strongly, curved. POL 1.78 OOL, OOL 1.7 OD. Vertex with minute piliferous punctures, which are few and remote between lateral ocelli and eyes but rather more numerous in the ocellar triangle. Eye 1.45 times as long as broad, with very short setae. In frontal view the anterior margin of clypeus is projecting somewhat, very shallowly emarginate medially. Mouth about twice malar space, the latter 0.37 length of eye. Antenna: scape 0.85 length of eye, 5.7 times as long as broad, reaching fully to level of middle of anterior ocellus; pedicellus plus flagellum 1.45 times breadth of head; pedicellus 2.2 times as long as broad, very slightly shorter than F1; anellus nearly quadrate, closely applied to F1; F1 1.9 times as long as broad, narrowing in its proximal half, its base hardly broader than the anellus, following segments decreasing gradually in length but increasing very slightly in breadth, F6 quadrate, F7 very slightly transverse; clava about twice as long as broad, slightly longer than F6 plus F7; sensilla moderately numerous, uniseriate, placed mainly in the distal half of each segment.

Mesosoma about twice as long as broad, rather weakly arched dorsally. Pronotum about 0.7 length of mesoscutum, mainly with extremely fine, slightly raised sculpture forming transverse ripples. Mesoscutum (partly pierced by pin) with extremely fine reticulation which tends to form transverse ripples, with small and remote piliferous punctures. Scutellum (fig. 82) not strongly convex, its base rounded, extremely finely reticulate, the sculpture fairly uniform; piliferous punctures very small and remote, setae somewhat raised; flange fairly broad, with distinct trabeculae. Dorsellum with indication of a median longitudinal furrow. Propodeum shiny, with delicate alutaceous sculpture, including the callus; spiracles rather small, about 1.7 times as long as broad. Mesepimeron nearly as high as mid coxa, nearly square. Hind coxa slightly more than twice as long as broad, its dorsal surface bare in basal half. Fore and hind femora moderately stout. Longer spur of hind tibia 0.39 length of basitarsus. Forewing 2.85 times as long as broad; costal cell 13.5 times as long as broad, its upper surface bare, lower surface bare except for a few setae in basal quarter and distal quarter; M:PM:ST=65:15:8.5, stigmal vein at a very oblique angle to PM, stigma small and shortly petiolate; basal cell bare except for 3 setae below SM; basal vein with 3 setae; no setae on subcubital vein; speculum partly open below, very long and extending below two-thirds of M, with a number of scattered setae on lower surface below M; wing just beyond speculum rather sparsely pilose, but moderately thickly distad.

Gaster rather strongly compressed; basal sternite about 1.5 times as long as hind

coxa; hypopygium bare except for a few setae at tip; ovipositor sheaths 1.1 times length of body, index 3.7. Length of body 3 mm.

Colour: head greenish with face and vertex bronze. Mesosoma green, with slight bronze tinge in places. Metasoma green, slightly tinged with bronze posteriorly. Antenna black with scape testaceous beneath, pedicellus bronze. Mandibles and palpi testaceous. Coxae green, rest of legs testaceous, the claws fuscous. Tegulae testaceous; wings hyaline, venation testaceous.

Male.— Unknown.

Comments.— *T. cyprianus* in most respects is very similar to the Mongolian *T. annularius* Széleányi, 1973, the holotype ♀ of which has been compared with it. *T. annularius* differs in having a few setae on the dorsal surface of the hind coxa, in its basal half; the tip of the hypopygium is nearly level with the apex of gaster (remote from it in *cyprianus*). The forewing is only about 2.5 times as long as broad, with eight or more setae in the basal cell, the speculum smaller, wing beyond it more thickly pilose, with rather shorter setae; ovipositor sheaths not longer than the body.

Biology.— Unknown.

Distribution.— Greece (Cyprus).

*Torymus druparum* Boheman, 1834  
(fig. 83)

*Torymus druparum* Boheman, 1834: 361-362, ♀; Olsson, 1957: 58-64; Boucek & Graham, 1978a: 226; Boucek, 1988: 144; Grissell, 1995: 279.

*Syntomaspis druparum*; Thomson, 1876: 76.

*Callimome druparum*; Hoffmeyer, 1930c: 236, in part.

[*Syntomaspis varians* Eady, 1959: 260; Graham, 1969: 69; Sellenschlo & Wall 1984: 21. All in part mis-identifications].

Type material.— **Neotype**, ♀ (BMNH): here designated "Sweden. Sk. [Skåne] Rolsberga Roverekulan RN-1354/6188, T.H.[Huddleston] & J.Q. [Quinlan] viii.1976".

Comments.— Boheman reared *druparum* from seeds of *Sorbus scandica* (1834: 361). It has been long confused with *varians* (Walker) which is associated with *Crataegus*. Three females stand in the Boheman collection under *druparum* in NR. They were examined by Graham in 1959 and were all referable to *varians*. We do not accept them as syntypes, although Graham (1969: 69) assumed that they were. Subsequent rearings have shown that *druparum* is associated with *Sorbus* species and with *Malus*, whilst *varians* is associated only with *Crataegus*.

Biology.— An account of the biology of the species was published by Olsson (1924).

Distribution.— Great Britain, Hungary, Netherlands, Russia, Slovakia, Sweden, Tasmania, North America.

*Torymus eadyi* spec. nov.  
(fig. 84)

Type material.— **Holotype**: ♀ (BMNH): Great Britain "ex *Lasioptera rubi* coll. 15.v.1959 em. 30-31.v.1959, Hants New Forest Wood crates R.D. Eady". **Paratypes**: 2 ♀♀ (BMNH): same data as holo-

type, 1 ♀ (MJG) "France Elzas-L. 1.v.1973 H.J. Vlug, /gal *Lasiopt. rubi* Coll. 17.3.73"; 1 ♀ (MJG) Netherlands "depot 80 *Lasioptera rubi* verz. 17.i.1967, Wageningen 22.ii.1967 W. Nijveldt"; 1 ♀ (TM) "Bulgaria, Varna, 21.08.1985, *Rubus* sp., *Lasioptera rubi* (Schrank)"; 1 ♀ (RMNH), "1.4.88 D-Ahlen M. Kuhlman, ex galle (Dipt) *Lasioptera rubi* (Schrank) 1, *Torymus macropterus* (Walker) U. Sellenschlo".

Description of female.— Morphology: head in dorsal view (fig. 84) at most slightly broader than long (2-2.1), temples 0.18-0.2 length of eye, very strongly converging and very slightly curved. OOL 1.9-2.05 OOL, OOL 1.0-1.1 OD. Vertex finely reticulate, with numerous minute piliferous punctures. In frontal view mouth 2.1-2.3 times malar space, the latter 0.34 length of eye; the clypeus is slightly produced, truncate. Antennae with toruli well above lower eyeline, hardly nearer to clypeus than to anterior ocellus; scape not reaching ocellus; pedicellus plus flagellum 1.4 times longer than breadth of head, flagellum proximally distinctly stouter than pedicellus, cylindrical; pedicellus 1.57 times as long as broad; anellus 1.3 times broader than long; F1 slightly longer than broad, following segments very slightly longer than broad or quadrate; sensilla very numerous, uniseriate.

Mesosoma 1.85 times as long as broad. Mesoscutum 1.25 times as broad as long finely sculptured, in front half more scaly rippled; piliferous punctures numerous but very small, separated by twice their diameter or more, setae of normal length, slightly raised. Scutellum 1.4 times as long as broad, its base rather narrowly rounded, finely sculptured, with punctures very slightly larger than those on mesoscutum, setae on hinder third longer and more raised; flange very narrow, finely trabeculate. Dorsellum nearly smooth. Propodeum very finely delicately alutaceous, slightly smoother medially, with a row of small fovea basally. Mesepimeron 1.3 times longer than broad and 0.75 times as long as mid coxa. Hind leg with coxa thickly hairy and strongly curved with fine, sometimes rather coarse reticulation, hind femur 3.9 times as long as broad, spur of tibia 0.44 length of basitarsus and only very slightly shorter or as long as breadth of hind tibia. Forewing: costal cell on upper side with one or two rows of setae more widely separated in the middle, the lower side has one row plus scattered setae except in the middle; basal cell with 1-3 setae below SM, closed; basal vein with 6-9 setae; speculum extending distinctly beyond parastigma, with some scattered setae on lower surface in upper half, nearly closed below. Wing beyond speculum moderately thickly, distally quite thickly pilose; M:PM:ST=47:11:4, ST is shortly petiolate or subsessile, slightly oblique.

Gaster slightly compressed, basal sternite projects by about one-third of hind coxa; hypopygium extending along three-quarters of gaster or slightly more, bare. Ovipositor as long as metasoma plus half of mesosoma, index 2.25-2.5. Length 5.2-5.5 mm.

Colour: head and mesosoma bright green, scape testaceous with a very small brown edge on dorsal side distally, tegulae and palpi, fore and middle legs including coxae, hind legs except basal half of coxae, which are green, testaceous. Gaster bluish-green, with two broad dark violet transverse bands.

Male.— Unknown.

Comments.— Graham wishes to honour the name of his late friend and colleague Ron D. Eady, who discovered the feature of dimorphism in female *Torymus* ovipositors. He made possible the present course of the species taxonomy by his study of the

Walker types and would have left us more invaluable contributions had not tragic circumstances prevented it.

The species differs from *T. rubi* Schrank by the smaller punctures on dorsum of mesosoma and by the more extensive yellow colour of the legs.

Distribution.— Bulgaria, France, Great Britain, Netherlands.

Biology.— Reared from galls of *Lasioptera rubi* Schrank (Hym. Cynipidae).

*Torymus eglanteriae* Mayr, 1874  
(figs 85-87)

*Torymus Eglanteriae* Mayr, 1874: 100-101, ♂ ♀; Sellenschlo & Wall, 1984: 24; Grissell, 1995: 280.

*Callimome eglanteriae*; Hoffmeyer, 1930c: 238.

*Torymus tiliarum* Ruschka, 1921: 337, ♂ ♀; Sellenschlo & Wall, 1984: 28; Grissell, 1995: 288, **syn. nov.**

*Callimome tiliarum*; Hoffmeyer, 1930c: 238.

Type material.— *Torymus eglanteriae* Mayr: **lectotype** ♀ (NHMW): here designated, on a minutien pin stayed on a pith block, labelled "Rtz" [Ratzeburg]; "Collect. G. Mayr; *Tor. eglanteriae* G. Mayr, Type".

**Paralectotypes** 2 ♂ ♂ and 2 ♀ ♀ (NHMW): similarly labelled, here designated.

*Torymus tiliarum* Ruschka: two females are pinned to a pith block and labelled "Austr. inf. Prchtdsdf. 2.7.84. Wachtl; 64; *Torymus tiliarum* Ruschka, Type"; a pale blue blank label. The left hand ♀ (NHMW) is here designated **lectotype** and has been so labelled by Graham; a red spot has been marked on the pith beside the specimen. The right-hand ♀ is designated **paralectotype**.

Comments.— *Torymus eglanteriae* Mayr: Mayr had three pairs reared from galls of *Rhodites eglanteriae*, received from Tischbein and determined by Ratzeburg. Two male and three female syntypes could be traced in NHMW.

*Torymus tiliarum* Ruschka. Ruschka had examined 6 males and ten females from Wachtl's collection (formerly in Forstinstitut, Vienna), reared from *Contarinia tiliarum* at at Perchtoldsdorf near Vienna, 2nd July, 1884. In NHMW we found two mounts with a male and a female each, on pith blocks, labelled (1) "Austr. inf. Prchtdsdf Wachtl 16.5.84" "*Contarinia tiliarum*" "*T. tiliarum* Ruschka type" "Type" (a red label); (2) "*Sciara tilicola?* *Diplos. ramicola* coll. Wachtl" "*T. tiliarum* m. det. Ruschka 21" "*T. tiliarum* Ruschka type". The first pair has the correct locality but the wrong date; the second pair does not appear to be syntypes.

Biology.— Reared from galls of *Diplolepis eglanteriae* (Hartig) (Hym. Cynipidae) and *Contarinia tiliarum* (Kieffer)(Dipt., Cecidomyiidae).

Distribution.— Austria.

*Torymus epilobii* spec. nov.  
(fig. 248)

Type material.— **Holotype**: ♀ (RMNH), Netherlands "'s Graveland 13.vii.1960 M.J. Gijswijt; uit gal *Dasyn. epilobii*". **Paratypes**: (BMNH, ZMA, MJG), Netherlands 1 ♀ topotypic; 1 ♀ topotypic but 18.vii.1960; 8 ♀ ♀, 1 ♂ "Leersum 12.viii.1971 H.J. Vlugg, /gal *Das. epilob.* op *Epilobium ang.* verz. 17.vii.971"; 2 ♀ 3 ♂ ♂ "Voorschoten Duivenvoorde B. Nübel, /gal *Dasyn. epilobii* ix.1978"; Germany 1 ♂, 1 ♀ "uit *Dasyn. epilobii* 5.viii.1969 M.J. Gijswijt, DEUTSCHLAND N. Sachsen Gildehaus"; 3 ♀ ♀ (one without gaster) "op *Dasyn. epilob.* 16-19.vii.1969 M.J. Gijswijt, DEUTSCHLAND N. Sachsen Gildehaus".



Description of female.— Morphology: head in dorsal view 1.9-2.0 times as broad as long; temples 0.26-0.3 apparent length of eyes, rather strongly converging, slightly curved. POL 2.0-2.2 OOL, OOL 1.0-1.1 OD. Vertex with excessively fine sculpture, with scattered very small punctures. In frontal view the head is trapeziform with virtually straight genae; face fairly thickly clothed with setae of average length. Clypeus (fig. ) very slightly produced, weakly curved. Mouth 2.0-2.05 length of malar space, malar space 0.33-0.37 length of eye. Antennae with toruli well above lower eyeline; scape 3.3 times as long as broad, nearly or just reaching anterior ocellus, occasionally a little above the lower edge; pedicellus plus flagellum 1.25-1.30 breadth of head, flagellum proximally slightly stouter than pedicellus, funicle nearly filiform, weakly clavate; pedicellus 1.75 times as long as broad (1.5 in a dwarf); anellus slightly transverse or nearly quadrate; F1 1.3 times as long as broad, F2-F4 slightly elongate, F5 and F6 quadrate, F7 very slightly transverse, in a dwarf F3-F7 very slightly transverse; clava 2.1 times as long as broad; sensilla very numerous in one irregular row.

Mesosoma 1.75 times as long as broad, notauli rather shallow. Mesonotum 1.15 times as broad as long with excessively fine sculpture, punctures numerous and fairly close, but very small, setae short, nearly decumbent. Scutellum 1.25 times as long as broad, with rounded base, sculpture as mesonotum, punctures less numerous, separated by more than twice their diameter, small, setae slightly longer and slightly raised, in posterior third much longer and strongly raised; flange very narrow, finely trabeculate. Dorsellum nearly smooth, with a trace of a median sulcus. Propodeum very finely delicately alutaceous, smoother medially. Mesepimeron 1.5 times as high as broad, very slightly shorter than length of mid coxa. Hind leg with coxa twice as long as broad, its hind edge strongly curved, the surface with rather coarse slightly raised reticulation, moderately thickly pilose; femur 3.6 times as long as broad; spur of tibia 0.43 length of basitarsus. Forewing 2.33 times as long as broad; costal cell 8.1 times as long as broad, upper surface bare except for a row of setae in distal third, below with one row plus scattered setae in the middle; basal cell nearly bare, closed, basal vein with 3-6 setae; speculum rather large extending distinctly beyond parastigma, partly open; M:PM:ST=43:10:3.9, stigma shortly petiolate or subsessile, very small.

Gaster slightly compressed, basal sternite extending beyond coxa by about one third length of latter; hypopygium extending about three quarters along gaster, bare except tip. Ovipositor index 2.1-2.5. Length 1.7-3.0 mm.

Colour: body green to bluish-green, sometimes with pleuron and coxa more or less brassy or coppery. Antenna black, scape testaceous with dorsal edge more or less dark. Palpi brownish. Coxae as mesosoma; hind femur more or less infusate, metallic medially, varying to mainly black; hind tibia sometimes more or less infusate, occasionally nearly wholly black. Tegulae usually yellow, infusate posteriorly in dark specimens. Wings hyaline, venation yellow-testaceous or testaceous. In the some females hovering around the galls the legs are very dark: all femora are mainly black, and all tibiae are heavily infusate.

Male.— differs from female as follows: scape blue-black; pedicellus plus flagellum about 1.4 times breadth of head; pedicellus hardly longer than broad, slightly stouter than F1, flagellum much stouter than pedicellus, cylindrical; segments quadrate, clothed with rather short, strongly curved black setae. Gaster suboval, shorter

and narrower than mesosoma, more or less bronzy in posterior half.

Comments.— The females resembles those of *T. chloromerus* (Walker) which have a somewhat narrower mouth related to malar space, yellow palpi and other differences as mentioned in the key.

Biology.— Reared from galls of *Dasineura epilobii* (Löw) (Dipt. Cecidomyiidae) on *Chamaenerion angustifolium*.

Distribution.— Germany, Netherlands.

*Torymus erucarum* (Schrank, 1781)  
(fig. 249)

*Ichneumon erucarum* Schrank, 1781: 275, ♀.

*Torymus erucarum*; Mayr, 1874: 87; Thomson, 1876: 86-87; Boucek, 1977: 25; Nikol'skaya & Zerova, 1978: 370; Sellenschlo & Wall, 1984: 24; Grissell, 1995: 280.

*Callimome erucarum*; Hoffmeyer, 1930c: 237.

*Cynips purpurascens* Olivier, 1790: 780, ♀.

*Ichneumon fulgens* Fabricius, 1798: 230, ♀.

? *Cleptes fulgens* Fabricius, 1804: 155, .

*Diplolepis fuliginosa* Spinola, 1808: 214, ♀; Graham 1994c: 99.

[*Callimome cynipedis* Walker, 1833: 119-120. Misidentification of *cynipedis* L.].

*Torymus fulgidus* Boheman, 1834: 345, ♀.

*Torymus rubripes* Ratzeburg, 1844: 179, ♀.

Type material.— *Ichneumon erucarum* Schrank, original material lost.

*Cynips purpurascens* Olivier. Original material lost.

*Cleptes fulgens* Fabricius (see *Ichneumon fulgens* F.).

*Ichneumon fulgens* Fabricius, **lectotype** ♀, in Bosc collection (MNHN), examined and designated by Graham (1969: 65). It lacks the head and is labelled "*C. fulgens* fab. n. s."; **paralectotype** ♀, here designated, in the Fabricius collection (Kiel).

*Diplolepis fuliginosa* Spinola. Original material destroyed.

*Torymus fulgidus* Boheman. No lectotype yet selected.

*Torymus rubripes* Ratzeburg. **Holotype** ♀, reared by Saxesen from an oak-bole gall on *Quercus* (lost). The species was synonymized with *erucarum* by Mayr (1874: 87) which is certainly correct.

Comments.— Schrank's description is very good for the period and leaves no doubt as to the identity of *T. erucarum*.

*Cynips purpurascens* Olivier: from the description it becomes clear that it was identical with *erucarum*. Olivier stated "Je l'ai trouvé dans les chantiers de Paris". In his days these chantiers (timber yards) existed near Rue du Grand Chantier, also on L' Isle Louvier, which then was a small island in the Seine east of Ile St. Louis. Cut timber stored there, no doubt including oak, would be a good source for Cynipidae associated with *erucarum*. The synonymy was recognised by Boucek & Graham, 1978: 71.

*Ichneumon fulgens* F. was synonymised with *T. erucarum* by Graham (1969: 65).

*Diplolepis fuliginosa* Spin.: Graham 1994: 99) gives reasons for placing it in synonymy with *erucarum*.

*Torymus fulgidus* Boh. One male and six females stand under the name *T. erucarum* in Boheman's collection (NR). The females certainly represent his series of *fulgidus*; one female is labelled "*erucarum fulgidus* Bhn" [possibly Thomson's hand]. All

belong to *erucarum* as generally understood. The species is synonymised by Mayr (1874: 87).

Biology.— Reared from galls of *Andricus quercusradicis* (Fabr.) (Hym. Cynipidae) on roots of *Quercus*.

Distribution.— Austria, France, Germany, Great Britain, Netherlands, Portugal, Yugoslavia.

*Torymus fagi* (Hoffmeyer, 1930)

*Callimome fagi* Hoffmeyer, 1930a:24, ♀

*Torymus fagi*; Grissell, 1995: 280.

Type material.— **Lectotype**, ♀, (MNHN): designated by Graham, here validated. It is attached by a micropin to a pith block and labelled “*fagi mai*”, “*Z*”, “*Callimome fagi m.*”, “*Callimome fagi* Hoffmeyer Type”, “TYPE” (on a red label).

Comments.— The type series consists of 1 ♂ and 3 ♀. Graham studied the specimens in 1972. No additional material has been seen since its description. The lectotype is extremely close to the female of *speciosus* Boheman, and they might be one species.

Biology.— Reared from galls of *Mikiola fagi* (Dipt. Cecidomyiidae) on *Fagus*.

Distribution.— France.

*Torymus fagineus* Graham, 1994  
(figs 88-89, 250)

*Torymus fagineus* Graham, 1994a: 22-24, ♂ ♀; Grissell, 1995: 280.

[*Torymus fulgens* Fabricius; Mayr, 1874: 36-37; Thomson, 1876: 81-82; Boucek, 1977: 25; Györfi, 1962: 209. Misidentifications].

[? *Torymus ventralis*; Györfi, 1962: 209. Misidentification].

Type material.— **Holotype**, ♀, (BMNH), Sweden, Skåne, Röstanga, 30.vi.1938 (D.M.S. & J.F. Perkins).

**Paratypes**: ♂, (ZB), Czech Republic, Bohemia, Horní Lipka, Sneznik, 16.viii.1962; 1 ♀ (MJG), France, Vaucluse, M.J. Gijswijt, Mont Ventoux, 26.vii.1975, on *Fagus* at 800 m; 2 ♂♂, 2 ♀♀ (BMNH), Mont Ventoux, Mt Serein (1) 28.vii.1984; Great Britain: 1 ♂ (BMNH), Berkshire, Sunninghill, 28.ix.1937; 1 ♂ (BMNH), Surrey, Bagshot, 28.ix.1937; Sweden: 2 ♀♀ (BMNH), Skåne, Degeberga, 10.vii.1938 (D.M.S. & J.F. Perkins); 1 ♀ (ZIL), Lund, 2 ♀♀ (ZIL), Hälsingborg (Thomson collection); 1 ♀ (BMNH), Röstanga; 4.vii.1938, 2 ♀♀ (BMNH), same locality 6.vii.1938; 1 ♀ (BMNH), same locality, 7.vii.1938; 1 ♀ (BMNH), Skärålid, 3.vii.1938, (D.M.S. & J.F. Perkins).

Biology.— Reared from galls of *Mikiola fagi* (Hartig) (Dipt. Cecidomyiidae).

Distribution.— Austria, Croatia, Czech Republic, France, Great Britain, Netherlands, Sweden.

*Torymus fastuosus* Boheman, 1834  
(figs 90-92, 251)

*Torymus fastuosus* Boheman, 1834: 347-348, ♀; Boucek, 1977: 25; Grissell, 1995: 280.

*Callimome fastuosum*; Hoffmeyer, 1930c: 236.  
*Syntomaspis fastuosa*; Nikol'skaya & Zerova, 1978: 369.  
*Torymus robustus* Ratzeburg, 1852: 225.  
*Torymus chrysis*; Nees, 1834: 67. [Misidentification].

Type material.— No type material has been designated.

Comments.— *Torymus fastuosus* Boheman. In 1959 Graham found under this name in Boheman's collection one female. It was labelled "Hlm" [Stockholm] but the type locality is Anneberg in Småland, so it is not certain if it can be selected as lectotype. It belongs, however, to *fastuosus* as generally understood.

*Torymus robustus* Ratzeburg was synonymised with *fastuosus* by Mayr (1874: 78). Boucek (1964: 670-671) reported that a male and two females, one labelled "robustus R.", stood under this name in the remnants of Ratzeburg's collection in Eberswalde. They were referable to *factuosus*, but Boucek was not sure whether they represented original material.

*Torymus chrysis* Nees. Nees' material lost. Most probably correctly synonymised by Mayr (1874: 78).

Biology.— Reared from galls of *Trigonaspis megaptera* (Panzer) on *Quercus*.

Distribution.— Croatia, Great Britain, Netherlands, Sweden.

*Torymus favardi* Steffan, 1962  
 (figs 93-94, 252)

*Torymus favardi* Steffan, 1962:186-188, ♀; Grissell, 1995: 280.

Type material.— **Holotype**, ♀, (MNHN), France: "Marseille (Bouches-du-Rhône); Août 1959; J.R. Steffan". **Paratypes**: 1 ♀ (MHNG), France: "ex galle de *Dryocosmus australis* Mayr, Le Bruse (Var); juillet, 1959"; 1 ♀ (MHNG), "ex galle d'*Andricus singulus* (Mayr), environ de Montpellier (Hérault) J. Favard".

Biology.— Reared from galls of *Contarinia cocciferae* Tavares (Dipt. Cecidomyiidae), *Dryocosmus australis* Mayr, *Andricus singulus* (Mayr) (Hym. Cynipidae) on *Quercus*.

Distribution.— France, Spain.

*Torymus filipendulae* spec. nov.  
 (figs 95-96, 253)

Type material.— **Holotype**, ♀, (BMNH), England: "Oxon. Oxford Canal, em. 16.8.1961 ex *Perrisia ulmariae* on *Filipendula*, M. de V. Graham". **Paratypes**: 1 ♂, 4 ♀♀ (BMNH), England: "Cambs., Woodwalton, 9.6.1963, M. de V. Graham"; 8 ♂♂, (BMNH), "England: Hunts. Woodwalton F (1) 9.6.1968 M. de V. Graham"; 1 ♀ (BMNH), "England: Cambs. Woodwalton Fen NNR 19-28.vii.1978, Fitton & Noyes Brit. Mus. 1978-339"; 1 ♀ (BMNH), "Oxon, Oxford Canal, em. 15.viii.1961 ex *Perrisia ulmariae* on *Filipendula ulmaria*, M. de V. Graham"; 1 ♀ (RRA), "Ex *C. ulmariae* gall Cohill, Berks., RA overwintered 1957-8"; 1 ♀ (MJG), Netherlands "Voorschoten 8.viii.1976 B. Nübel / gal *Dasyneura ulmariae* coll. 16.vii.1976".

Description of female.— Morphology: head in dorsal view (fig. 95) 1.75-1.9 times as broad as long; temples 0.22 apparent length of eyes, rounded. POL 1.73 OOL, OOL 1.4-1.45 OD. Vertex with fine, partly engraved reticulation, and scattered very small punctures. Head in front view suboval, genae slightly curved. Face fairly thickly clothed with thin pale setae. Eyes 1.35 times as long as broad, separated by slightly less than their length. Mouth 2.4-2.43 malar space, the latter 0.27 length of eye. Anterior margin of clypeus (fig. ) slightly produced, weakly curved. Antenna (fig. 96): toruli above ventral edge of eyes but distinctly nearer to anterior margin of clypeus than to anterior ocellus; scape 0.7 length of eye, reaching at most to lower edge of anterior ocellus; pedicellus plus flagellum about 1.3 times breadth of head, flagellum proximally hardly stouter than pedicellus; pedicellus 1.8-1.85 times as long as broad, somewhat longer than F1; anellus somewhat broader than long; F1 slightly longer than broad, F2 to F4 slightly longer than broad in larger females, quadrate in small females, following segments quadrate, or F7 very slightly transverse; clava about 2.2 times as long as broad, as long as F7+F6+half of F5; sensilla sparse, uniseriate.

Mesosoma 1.75 times as long as broad, strongly arched dorsally. Propodeum sloping nearly vertically. Mesoscutum 1.15 times as broad as long, both it and the scutellum with very fine and superficial or partly engraved nearly isodiametric reticulation; piliferous punctures minute, rather remote. Scutellum 1.25 times as long as broad, narrowly rounded basally, with excessively fine superficial reticulation; setae in posterior third longer and more raised, flange very narrow, without distinct trabeculae. Dorsellum very finely reticulate. Propodeum with very fine and superficial alutaceous sculpture, with a row of small foveae along its anterior border; spiracles small, about 1.5 times as long as broad, nearly or about twice their length from posterior margin. Mesepimeron less high than mid coxa (16:21), 1.4-1.5 times as high as broad. Hind coxa 2.8-3.0 times as long as broad, its hind margin distinctly curved only in basal quarter, dorsal surface bare in basal half, outer surface with somewhat coarse but superficial or partly engraved reticulation. Hind femur 3.8-4.5 times as long as broad. Spurs of hind tibia unequal, the longer one about 0.5 length of basitarsus. Forewing 2.2 times as long as broad; costal cell 10-10.5 times as long as broad, upper surface with one complete row of setae, lower surface with a complete row plus scattered setae in basal fifth and distal third; M:PM:ST=7:2:1, stigma petiolate, somewhat oblique, small; basal cell bare or with a few setae below SM, closed below; basal vein with 3-5 setae; speculum moderate-sized, partly open below, extending below M for about one third the length of this vein; wing just beyond speculum moderately thickly setose, more thickly distad.

Gaster ovate, about as long as mesosoma, slightly compressed; basal sternite extending somewhat beyond tip of hind coxa; hypopygium bare except for a few setae at its tip, which is situated at about 0.75 length of gaster. Ovipositor index 1.85-2.0, sheaths about as long as metasoma plus one third of mesosoma. Length 1.4-1.8 mm.

Colour: head green to blue; vertex more or less purple. Mandibles and palpi testaceous. Antennal scape testaceous, more or less infuscate dorsally, rest of antenna fuscous to black.

Mesosoma green to blue-green. Gaster green to blue-green, usually more or less reddish or testaceous at base. Legs testaceous with fore coxae green to blue-green at

base or up to about half their length, mid coxae mainly green, hind coxae with proximal half or slightly more green; occasionally the hind femora are infuscate medially, sometimes the fore and mid femora infuscate proximally; claws brown. Tegulae brownish. Wings hyaline, venation pale testaceous.

Description of male.— Differs from female as follows:

Morphology: antennal scape about 3 times as long as broad, its external surface extremely finely reticulate and dull; pedicellus about 1.5 times as long as broad and about 1.5 times as long as broad and about 1.5 times as long as F1; funicle proximally hardly stouter than pedicellus, but thickening slightly distad, its segments quadrate, F1 sometimes slightly shorter than F2, clava about 2.7 times as long as broad, about as long as F7+F6+half of F5; flagellum clothed with curved pale setae, 2 whorls on each segment (sometimes only one on F1). Gaster shorter and much narrower than mesosoma. Length 1.1-1.5 mm.

Colour: antennal scape black. Coxae mainly dark, hind coxae wholly so, Hind femora broadly black with metallic tint. Fore and mid femora more or less infuscate proximally. Hind tibiae broadly infuscate medially.

Comments.— The female of *T. filipendulae* is close to that of *T. angelicae* (Walker), which differs in having the head about twice as broad as long, temples slightly shorter and converging more distinctly, mouth only 2.0 malar space, anterior margin of clypeus (fig. ) distinctly produced, anellus virtually quadrate, mesosoma less strongly arched dorsally, dorsellum nearly smooth, ovipositor index 2.15-2.5, sheaths about as long as metasoma plus half of mesosoma, length of body usually greater (up to 2.5 mm).

In colour, female *angelicae* differs in having the gaster more extensively reddish or yellowish ventrally, often with the pale colour extending dorsally to form a subbasal ring; legs usually yellow with only hind coxae partly dark.

Biology.— Parasite of *Dasineura ulmaria* (Bremi) (Dipt., Cecidomyiidae) on *Filipendula ulmaria* (Rosaceae).

Distribution.— Czech Republic, Great Britain, Netherlands.

*Torymus fischeri* Ruschka, 1921  
(figs 97-98)

*Torymus Fischeri* Ruschka, 1921: 341-342, ♂ ♀; Boucek, 1994: 74.

[*Torymus hormomyiae*; Sellenschlo. & Wall, 1984: 66. Misidentification].

Type material.— **Lectotype**, ♀, (NHMW): here designated "*Torymus fischeri* Ruschka" (mounted on pith block with 3 others); "*Torymus fischeri* Ruschka M. de V. Graham det. 1993". **Paralectotypes**: 3 ♀ ♀, (NHMW) "*Torymus fischeri* Ruschka".

Comments.— Described from 2 ♂ ♂ and 21 ♀ ♀ reared by Wachtl from *Hormomyia fischeri* Frauenfeld, 24.vi.1884, collected in the Prater, Vienna. Only four ♀ ♀ syntypes have been located in NHMW. They are on minuten pins stayed on a pith block, without original labels but with a recent one stating that they stood under this name. Two syntypes lack gasters, the other two are in good condition. The best preserved female, here designated lectotype, has been remounted by Graham, whose lectotype label is now attached to it. The other three specimens are designated paralectotypes.

The female seems to be well characterised by the small, sublinear areas of micro-

pilosity on the ventral surface of funicular segments F5, F6 and F7. (fig. 98). The setae of mesoscutum and scutellum are pale golden in colour.

Distribution.— Austria, Czech Republic.

Biology.— Reared from *Proshormomyia fischeri* Frauenfeld on *Carex*.

*Torymus flavipes* (Walker, 1833)  
(fig 99)

*Cynips auratus* Geoffroy in Fourcroy, 1785: 380, ♀ [junior homonym of *C. aurata* Müller 1764].

*Torymus auratus*; Eady, 1959: 266-268; Askew, 1961; 1965: 219-225; Boucek, 1977:24; Boucek & Graham, 1978a: 226; Nikol'skaya & Zerova, 1978: 373; Sellenschlo & Wall, 1984: 21 Graham, 1992b:1098; Graham, 1994d; Grissell, 1995: 275.

*Callimome flavipes* Walker, 1833: 124, ♂ ♀.

*Torymus flavipes*; Thomson, 1876: 92.

[*Callimome Dauci* (Curtis MS.) Walker, 1833: 124-125. Misidentification].

*Callimome autumnalis* Walker, 1833: 125, ♀. **Syn. nov.**

*Callimome mutabilis* Walker, 1833: 127, ♂ ♀. **Syn. nov.**

*Callimome latus* Walker, 1833: 128, ♂ ♀. **Syn. nov.**

*Callimome aequalis* Walker, 1833: 129, ♂. **Syn. nov.**

*Callimome chlorinus* Walker, 1833:129, ♀. **Syn. nov.**

*Callimome leptocerus* Walker, 1833: 129, ♂ ♀. **Syn. nov.**

*Callimome meridionalis* Walker, 1833: 131, ♀. **Syn. nov.**

*Callimome terminalis* Walker, 1833: 132, ♂ ♀. **Syn. nov.**

*Callimome stramineitarsus* Walker, 1833: 135, ♀. **Syn. nov.**

*Callimome minutus* Walker, 1833: 137, ♂ ♀. **Syn. nov.**

*Callimome gracilis* Walker, 1833:137, ♀. **Syn. nov.**

*Callimome exilis* Walker, 1833:138, ♀. **Syn. nov.**

*Callimome ater* Walker, 1833: 138, ♂. **Syn. nov.**

*Torymus viridissimus* Boheman, 1834: 358, ♂ ♀; Thomson, 1876: 90-91. **Syn. nov.**

*Torymus euchlorus* Boheman, 1834: 359; Thomson, 1876: 91-92, ♂ ♀. **Syn. nov.**

[*Torymus muscarum* Nees, 1834: 58. Misidentification].

*Torymus propinquus* Foerster, 1840: xxx, ♀. **Syn. nov.**

*Torymus nanus* Foerster, 1840: xxxi, ♀. **Syn. nov.**

*Torymus appropinquans* Ratzeburg, 1844: 179, ♀. **Syn. nov.**

*Torymus Nördlinger* Ratzeburg, 1844: 179, ♀. **Syn. nov.**

*Torymus hibernans* Mayr, 1874: 111, ♂ ♀. **Syn. nov.**

*Torymus sodalis* Mayr, 1874: 120, ♀. **Syn. nov.**

Type material.— *Cynips auratus* Geoffroy: original material destroyed. **Neotype**, ♀, (BMNH): France, Seine et Marne, Forêt de Fontainebleau, 12.viii.1981 (Graham) designated by Graham (1992: 1098). Lectotypes were designated for all Walker species (except *terminalis* and *gracilis*, for which no material was found in BMNH) by Eady (1959: 266-268), but the details need not repeating here.

*Callimome terminalis* Walker: **lectotype**, here designated, ♀, (OUM, Dale collection): Labels "25" (white ticket); "646/38" (red ink) in J.C. Dale's hand; "*Callimome terminalis* Walk. Name in Dale Coll". Graham lectotype label. Paralectotype, here designated, ♀ (NMI), number 285, with a pencilled "35" on its card above and "termina" on lower surface.

*Callimome gracilis* Walker: **Lectotype**, here designated, ♀, (NMI, No. 254) with a pencil number "42" on upper surface of its card and "*gracile*" on the lower surface.

*T. viridissimus* Boh.: **Neotype**, ♀ I, (ZIL): here designated, labelled: "S:Sm, Bergkvara 6.vii.1993 ex cult. Leg. R.D. Danielssen, Ur *Biorrhiza pallida* galler tagna på *Quercus robur* 23.vii.1993" "*Torymus viridissimus* Boh. M. de V. Graham det. 1994. Neotype ♀".

*T. euchlorus* Boh. **Lectotype**, ♀, (NR): here designated. It is labelled "V.G." [Vestrogothia]; "Bhn." [Boheman]; "Thoms."

No material of *T. propinquus* Foerster and of *T. nanus* Foerster was found in NHMW.

No type material of *T. appropinquans* Ratz. is available.

Original material of *Torymus Nördlingeri* Ratz. is lost.

*T. sodalis* Mayr. **Lectotype**, ♀, (NHMW): here designated, labelled: "21/3/Z Schlecht." "collect. G. Mayr" "*Tor. sodalis* G. Mayr Type". **Paralectotype**: ♀, (NHMW): here designated, similarly labelled.

A **lectotype** for *T. hibernans* Mayr, ♀, (NHMW) is here designated. It is mounted with a male on one pith block and labelled: "Collect. G. Mayr; *Tor. hibernans* G. Mayr, Type; lentic. 20/3 71".

Comments.— *Cynips auratus* Geoffroy is a junior homonym of *Cynips auratus* Müller, 1764.

It is not widely known that the Haliday collection (NMI, Dublin) contains many Walker specimens which are certainly syntypes. In several cases where Walker's material is not present in BMNH, specimens have been located by Graham in Haliday's collection; the serial numbers cited were attached to all specimens in the collection when he rearranged it many years ago. The following are relevant here: the lectotype of *Callimome terminalis* Walker is a Walker specimen, sent to Dale in 1847 and from the style of mounting it appears to be an early specimen. The specimen belongs to the diapause generation of *flavipes* (see Eady, 1959: 268). Eady synonymised *terminalis* with *auratus* (now *flavipes*) on the basis of two specimens (not syntypes) in the Greville collection (Edinburgh) and his action is now confirmed.

*Callimome gracilis* Walker was placed in synonymy by Walker (1846: 17) with *galii* Boheman and this was followed by Mayr (1874: 121) and Eady (1959: 268), although no original material had been found. It belongs to the summer form (Eady, 1959: 268) of *T. flavipes*.

*T. viridissimus* Boh. Walker (1846: 16) placed *viridissimus* in synonymy with *auratus* Fonsc. [sic], which was followed by Mayr (1874: 115), though neither author apparently saw original material. Thomson (1876: 90) who most probably saw it, redescribed *viridissimus*; the females in his collection belong to the summer form of *flavipes*.

*T. euchlorus* Boh.: four female syntypes exist in the Boheman collection (NR), all referable to *flavipes* (Walker). The label with "Thoms." was one that Thomson used to add to specimens which he considered to be types.

*T. propinquus* Foerster: Boucek (1964: 670) found four females standing under this name in the remnants of Ratzeburg's collection in Eberswalde; they all belonged to *T. flavipes* Walk.

*T. nanus* Foerster: in the collection of RMNH there is a female labelled "Mayr Germ." and "Museum Leiden *Torymus nanus* Förster", which may be taken as an indication. It appears to be a very small specimen of *flavipes*, which suggests that Mayr was correct in placing *nanus* (1874: 115) as a synonym of *T. auratus* Fonsc. (= *flavipes*).

*T. appropinquans* Ratz.: Boucek (1964: 669) found a female in the remnants of the Ratzeburg's collection in Eberswalde, labelled "appropinquans R." He stated that Mayr's (1874: 63) synonymy with *auratus* (Geoffroy) (now *flavipes* Walker) was probably correct.

*T. Nördlingeri* Ratz.: Mayr (1874: 113) synonymised this species with *T. cultriventris*. However, Ratzeburg stated that he had only one female from "Zweig



Galläpfeln", which suggests *flavipes* rather than *cultriventris*.

*T. sodalis* Mayr: syntypes presumably in NHMW (not seen). Synonymised with *auratus* (Fourcroy) (now *flavipes* Walker) by Eady (1959: 266). It is now formally placed in synonymy with *flavipes* (Walker).

*T. hibernans* Mayr: there are 11 mounts in NHMW, bearing 10 males and 11 females, all apparently syntypes. They belong to the overwintering form of *flavipes* (Walker). The species was synonymised with *auratus* (Fourcroy) by Eady (1959: 266).

Variation.— The colour of the body and legs varies considerably, specimens of the diapause generation being darker than those of the summer generation. In females of the diapause generation the body tends towards dull green or bronze green, whilst the femora are extensively darkened, the tibiae often so. In females of the summer generation the body is normally bright green to blue, the legs are extensively yellowish, sometimes wholly so except the coxae of mid and hind legs.

Biology.— Reared from Cynipid galls in oaks.

Distribution.— Probably the whole of Europe.

*Torymus flavovariegatus* Gijswijt, 1990

*Torymus flavovariegatus* Gijswijt, 1990: 44-45, ♂ ♀; Grissell, 1995: 281.

Type material.— **Holotype**, ♀, (ZMA): "ESPANA, Soria, M.J. Gijswijt; 10 km S. ABEJAR, on *Juniperus thurifera*, 24-27.vi.1987". **Paratypes**: (MNCN, BMNH, ZMA, MJG): 10 ♀ ♀, 19 ♂ ♂ same data as holotype; 4 ♀ ♀, 1 ♂ "ESPANA, Soria, M.J. Gijswijt; 10 km S ABEJAR, 24-27.vi.1987".

Biology.— Associated with *Juniperus thurifera*, probably a parasite of *Etsuhoa thuriferae* Skuhrová (Dipt. Cecidomyiidae).

Distribution.— Spain.

*Torymus formosus* (Walker, 1833)  
(figs 100-101)

*Callimome formosus* Walker, 1833: 122, ♂ ♀.

*Torymus formosus*; Boucek, 1977: 25; Boucek & Graham, 1978a: 227; Sellenschlo & Wall, 1984: 25; Grissell, 1995: 281.

*Torymus amoenus* Boheman, 1834: 348-349, ♀; Mayr, 1874: 117-118; Thomson, 1876: 89; Eady, 1959: 262.

*Callimome amoenum*; Hoffmeyer, 1930c: 240.

*Torymus compressus* Foerster, 1840: xxx, ♂ ♀. **Syn. nov.**

Type material.— The **lectotype** of *Callimome formosus* Walker ♀ (BMNH) labelled "*Callimome formosus* Walker lectotype, M. de V. Graham & Z. Boucek det. 1976". This designation is here validated.

*Torymus amoenus* Boheman. **lectotype**, ♀, (NR): here designated, is labelled "VG" and "Bhn".

*Torymus compressus* Foerster: **lectotype**, ♀ (BMNH): here designated.

Comments.— *Callimome formosus* Walker. Eady (1959: 262) found no material in BMNH. In 1976 Boucek & Graham found, standing under "*C. pretiosus*", a female which agreed well with the description of *formosus*. They labelled it as mentioned above. It is worth mentioning that there is another female *formosus* standing under "*pretiosus*" in the Curtis collection.

*Torymus amoenus* Boheman: three females stand under this name in the Boheman collection (NR) but two have Scania as provenance, so cannot be syntypes. The third is labelled lectotype by Graham.

*Torymus compressus* Foerster. No material has been found in NHMW. Mayr (1874: 117) said that he had seen "ein typisches Weibchen" from the Frauenfeld collection, on the basis of which he synonymised *compressus* with *amoenus*. This is confirmed by a female from Foerster's collection in BMNH, labelled in his hand "*Torymus compressus* Foerster Aachen", lacking the head; it is labelled lectotype.

Biology.— Reared from cynipid galls in *Quercus*.

Distribution.— Czech Republic, France, Germany, Great Britain, Netherlands, Slovenia, Sweden.

*Torymus fractiosus* spec. nov.

Type material.— **Holotype**, ♀, (BMNH): "France, Vaucluse, Mont Ventoux, Col de Perrache, em. 22.6.1982 ex leaf-edge gall on *Rosa rubiginosa*, M. de V. Graham". **Paratypes**: (BMNH, RMNH, MJG), 2 ♀♀ same data as holotype; 2 ♀♀ (MJG) "France Dept. Vaucluse M. Ventoux M.J.Gijswijt, gal *Wachtl. rosarum* coll. 28.vi.1980 uit viii 1980". 1 ♂ same data (supposed to be the species).

Description of female.— Morphology: head in dorsal view 2.05 times as broad as long, temples 0.26 apparent length of eyes, rather strongly converging, slightly curved. POL 2.1-2.35 OOL, OOL 1.07 OD. Vertex with numerous fairly distinct punctures. Frontally seen the head is trapeziform with straight genae; clypeus truncate; mouth 2.0-2.1 times as long as malar space, the latter 0.28-0.3 length of eye. Antennae with toruli well above lower eyeline, but slightly nearer to clypeus, pedicellus plus flagellum 1.26 times breadth of head; flagellum proximally slightly stouter than pedicellus, rather weakly clavate; scape 3.7 times as long as broad, not quite reaching anterior ocellus; pedicellus 1.75 times as long as broad; anellus about 1.3 times as broad as long; F1 1.15 times longer than broad following segments quadrate, F7 very slightly transverse, in large females F1 to F3 are very slightly elongate; clava twice as long as broad; sensilla numerous, uniseriate. Face rather thickly clothed with thin short white setae

Mesosoma 1.9-2.0 times as long as broad. Mesoscutum 1.0-1.1 times as broad as long, rather dull with excessively fine reticulation which is more or less scaly in frontal half; punctures numerous but very small, separated by twice their diameter or more; setae of normal length, slightly raised. Scutellum 1.35 times as long as broad, with rounded base, sculpture as on mesoscutum, punctures in basal third slightly larger and closer; setae of hind third long and more raised; flange very narrow minutely trabeculate. Dorsellum virtually smooth, with a trace of a sulcus. Propodeum with extremely finely superficial sculpture, nearly smooth, medially with a row very small fovea. Mesepimeron 1.5 times as high as broad, distinctly shorter than mid coxa. Hind leg with coxa 2.3 times as long as broad, its hind edge moderately curved, with a somewhat coarse, raised reticulation, pilose in basal half; femur 4.2 times as long as broad; longer spur of tibia 0.41 length of basitarsus. Forewing 2.75 times as long as broad; costal cell 8.5 times as long as broad, upper surface bare except one row of setae over distal half or two-third (complete in one specimen); basal cell bare,

or with 2-3 setae, closed over distal half or more; basal vein with 6-8 setae; speculum moderately large, extending slightly beyond parastigma, partly open; M:PM:ST=64:17:6, stigma oblique, small.

Gaster hardly compressed; basal sternite reaches only very slightly beyond coxa; hypopygium extending three-quarters beyond gaster, bare except tip. Ovipositor index 2.25-2.55. Length 2.5-3.0 mm.

Colour: body bright golden-green to bluish-green. Antennae black, scape testaceous beneath. Mid and hind coxae, and proximal one-third to half of fore coxae, coloured like body. Legs otherwise yellowish-testaceous, with hind femora narrowly to moderately broadly infuscate, hind tibiae lightly infuscate medially. Fifth tarsal segment brown, four slightly brownish. Tegulae yellowish, slightly darker posteriorly. Wings hyaline, venation yellowish-testaceous.

Male.— The specimen attributed to this species differs as follows: scape about 3 times as long as broad, not nearly reaching anterior ocellus, outer surface minutely granulate; pedicellus plus flagellum 1.27 times breadth of head, flagellum proximally distinctly stouter than pedicellus, weakly clavate, thickly clothed with short, curved, black setae.; pedicellus about 1.5 times as long as broad, not longer than F1 following segments quadrate, F7 slightly transverse; Antennae black. Hind femora mainly black, fore and mid femora infuscate proximally, hind tibiae infuscate medially.

Comments.— The female of *fractiosus* is very close to that of *wachtliellae* spec., nov. but differs in shorter ovipositor, shorter malar space (in *wachtliellae* 0.32-0.34), pleuron of mesosoma and sides of gaster at most weakly golden, hind femora and tibiae tending to be slightly infuscate. From *T. epilobii* and *T. pastinacae* females it differs in shorter malar space, rather more distinct punctures on sides of upper face, and hosts. In *epilobii* the hind femora are more or less, often broadly, infuscate or black, the hind tibiae more or less infuscate to black medially, occasionally the fore and mid femora are more or less infuscate; in *pastinacae* the fore coxae are mainly or wholly dark, the hind femora less heavily infuscate medially.

Biology.— Reared from galls of *Wachtliella rosarum* (Hardy) on *Rosa*.

Distribution.— France.

*Torymus frater* Thomson, 1876  
(figs 102-103)

?*Torymus parellinus* Boheman, 1834: 372-373.

[*Torymus parellinus*; Mayr, 1874: 128-129. Misidentification].

*Torymus frater* Thomson, 1876: 97, ♀; Grissell, 1995: 281.

Type material.— **Lectotype** of *Torymus frater* ♀ (ZIL), selected by Graham, validated by Hansson (1991: 11) (Type, ZIL no. 1546: 1).

Comments.— There is a female in the Boheman collection (NR) standing under *T. parellinus* and labelled "Dv" [Dovre, Norway] which cannot be regarded as a syntype. The type locality should be Vestrogothia. This specimen is identical with *T. frater* Thomson. This is a little known species.

Biology.— Unknown.

Distribution.— Norway, alpine region.

*Torymus fuscicornis* (Walker, 1833)  
(fig. 104)

*Callimome posticus* Walker, 1833: 137, ♀.

*Callimome fuscicornis* Walker, 1833: 138, ♂ (not ♀).

*Lioterphus fuscicornis*; Eady 1959: 261; Nikol'skaya & Zerova, 1978; 368; Sellenschlo & Wall, 1984: 29.

*Torymus fuscicornis*; Grissell; 1995: 281.

*Lioterphus mölleri* Thomson, 1876: 99, ♂ ♀; Hoffmeyer 1930 c.

*Torymus Mölleri*; Schmiedeknecht, 1914: 208.

Type material.— *Callimome posticus* Walker: original material not found (Eady, 1959: 261).

*Callimome fuscicornis* Walke: **lectotype**, ♂ (not ♀) (BMNH): type Hym. 5.1609 designated by Eady (1959: 261).

*Lioterphus mölleri* Thomson: **lectotype**, ♂, (ZIL), type 1549.1 "HK1 6/74", "Mölleri: Thoms." selected by Graham, validated by Hansson (1991: 11).

Biology.— Reared from birch catkins with *Semudobia* spp. (Dipt. Cecidomyiidae).

Distribution.— Widespread in Europe, possibly over the whole *Betula* zone.

*Torymus fuscipes* Boheman, 1834  
(fig. 105)

*Torymus fuscipes* Boheman, 1834: 374-375, ♀; Mayr, 1874: 108-109, in part; Thomson, 1876: 88: Boucek, 1977: 25; Sellenschlo & Wall, 1984: 25; Grissell, 1995: 281.

[*Torymus cupratus*; Mayr, 1874: 75-76 (male only). Misidentification]

*Callimome fuscipes*; Hoffmeyer, 1930c: 238.

Type material.— **Lectotype**, ♀, (NR): here designated, the single female in Boheman's collection; it is labelled "Sm" [Småland] and "Bhn".

Comments.— The lectotype agrees with Thomson's interpretation. The ovipositor index is 3.3.

Biology.— Reared from galls of *Helicomylia saliciperda* (Dufour) (Dipt. Cecidomyiidae).

Distribution.— Sweden, Yugoslavia.

*Torymus galeobdolonis* spec. nov.  
(fig. 106)

Type material.— **Holotype**, ♀, (RMNH), "Ex *Dasyneura galeobdolonis* Winn.16979 Em. 8.v.1947; England, Surrey Seisdon Wood 26.ix.1946 M. Niblett B.M. 1957-610; *dauci* Mayr or *pruni* Cam.; *Galeobdolonis* M. de V. Graham det. 19". **Paratypes**: 2 ♂♂ and 2 ♀♀ (RRA), "Ex *Dasyneura galeobdolonis* M. Niblett don. H. Britten".

Description of female.— Morphology: head in dorsal view 2.0-2.2 times as broad as long; temples 0.25 apparent length of eye; converging strongly, curved. POL 1.9-2.15 OOL, OOL about 1.1 OD. In frontal view (fig. 106) the head is trapeziform, with straight genae. Clypeus, produced, slightly curved. Mouth 2.1-2.4 malar space, the latter 0.3-0.35 length of eye. Antennal toruli well above lower eyeline, distinctly nearer

to clypeus than to anterior ocellus; scape 3.6 times as long as broad, not reaching lower edge of anterior ocellus; pedicellus plus flagellum at most 1.2 breadth of head, flagellum proximally slightly broader than pedicellus, only slightly clavate; pedicellus 1.7 times as long as broad; anellus slightly broader than long; F1 quadrate, shorter than pedicellus, F2 very slightly longer than broad, following segments transverse, F6 distinctly so; clava 1.7 times as long as broad; sensilla uniseriate. Face set with long silvery hairs. Reticulation on vertex more coarse than usual, with small punctures.

Mesosoma 1.7 times as long as broad. Mesoscutum 1.4 times broader than long, with relatively coarse reticulation and a number of well visible punctures; setae long and raised. Scutellum 1.2 times longer than broad, subtruncate; sculpture and setae as on mesonotum; flange and dorsellum nearly smooth. Propodeum finely alutaceous with a row of large fovea along base. Mesepimeron 1.6 times longer than broad, distinctly longer longer than mesocoxa (21:27). Hind leg with coxa twice as long as broad, hairy in basal half dorsally with rather coarse raised sculpture; femur 4.1 times as long as broad; longer spur of tibia about half as long as basitarsus. Forewing 2.5 times as long as broad, with long hairs; costal cell about 8 times longer than broad, with complete a complete hairrow on either side plus at least a partial extra hairrow distally on the upper side and a complete second row on the underside. Basal cell with a number of strong setae, closed; speculum extending halfway M, partly closed; M:PM:ST=65:16:7.5, stigma petiolate.

Gaster not compressed, basal sternite very slightly exceeding hind coxa; hypopygium extending about two-third gaster, bare except tip. Ovipositor index 2.0-2.4, sheaths as long as metasoma plus two-third mesosoma. Length 2.3-3.1 mm.

Colour: head and mesosoma bright green, sides with golden reflections; palpi yellow, tegulae testaceous; coxae coloured as mesosoma, fore and mid legs testaceous, hind femora and tibiae darkened. Wings hyaline, venation testaceous. Gaster brown with green reflections.

Male.— The males reared from the same host have collapsed heads so that no useful measurements can be made. The legs are only slightly darker than those of the holotype, the sculpture of mesonotum and scutellum is not different from that of the females.

Comments.— The gaster of the holotype is detached and glued to the card. Moreover the antennae are partly broken off. This species resembles *T. chloromerus* (Walker) but differs from it by the more conspicuous punctures on mesosoma and by the long hairs on face, mesonotum and wings.

Biology.— Reared from galls of *Dasineura galeobdolonis* Winnertz (Dipt., Cecidomyiidae).

Distribution.— Great Britain.

*Torymus galii* Boheman, 1834  
(figs 107-109)

*Torymus Galii* Boheman, 1834: 344-345, ♂ ♀.

*Torymus galii*; Mayr, 1874: 121-122 (excluding synonym); Erdős, 1960: 363; ? Nilsson, 1979: 540; Selenschlo & Wall, 1984: 25 in part (excluding records from *Quercus*); Grissell, 1995: 281.

[*Torymus Galii*; Thomson, 97; see comments].

*Callimome galii*; Hoffmeyer, 1930c: 243, 253.

Type material.— No types designated.

Comments.— Boheman stated “E gallis *Galii veri* exclusus. Dom. DALMAN. Mus. Reg. Acad. Scient. Holm.”. This suggests that Dalman was the collector. There are 10 specimens (1 male, nine females) in Boheman’s collection (NR). In 1959 Graham examined these and labelled one female “This specimen seems to fit best the description of *galii*”; it has earlier labels: “Sm” [Småland] and “Bhn”. It is not certain whether this should be taken as lectotype but it agrees with recent material reared from *Galium*. Our concept of *galii* is based on the above Boheman female and reared material.

Thomson’s series under *galii* is mixed, some specimens belonging to another species-group. His description does not fit *galii*.

Walker (1846: 17) incorrectly synonymised his *Callimome gracilis*, 1833, with *Torymus galii* (see under *auratus*).

Biology.— Reared from galls of *Geocrypta galii* Loew (Dipt. Cecidomyiidae) on *Galium verum* and from galls on *Galium verrucosum* Hudson.

Distribution.— France, Germany, Great Britain, Hungary, Netherlands, Spain, Sweden.

Variation.— In the original description the species is said to be reared from galls on *Galium verum*. The ovipositor should be as long as mesosoma plus head. None of the specimens reared in Europe from this host have the ovipositor as long as that: it is only slightly longer than the gaster and about as long as mesosoma, the index being 1.45-1.5. The specimens reared from galls on *Galium verrucosum* in Spain have an index of 1.8, which is more in accordance with the description. So far we consider *T. galii* as a species with a variable ovipositor length. In this light it might even be possible that *T. lathyri* spec. nov. is an extreme form of *galii*.

*Torymus genisticola* Ruschka, 1921  
(figs 110-111)

*Torymus genisticola* Ruschka, 1921: 341, ♂ ♀; Sellenschlo & Wall, 1984: 25; Grissell, 1995: 281.  
*Callimome genisticola*; Hoffmeyer, 1930c: 242.

Type material.— **Lectotype**, ♀, (NHMW): here designated, the largest female (2.15 mm) of a group of 1 male and three females mounted on a pith block, labelled “*Cec. genisticola* Znaim 27.8.80 coll. Wachtl”, “Type” (red label). **Paratypes**: (NHMW), (here designated) the other specimens on the pith block plus 13 females and 5 males on the left hand side of a large pith block labelled “Moravia Znaim 27.8.80 Wachtl”, “20”. The paratypes are labelled as such.

Comments.— The full description of the large pith block with 18 paratypes is as follows: it is labelled “Moravia Znaim 27.8.80. Wachtl”; a label with a horizontal bar, in lower part “20”; “1. *Torymus genisticola* Ruschka Type; 2. *Systasis* sp.; 3. *Eutelus* sp.; 4. *Habrocytus*?; 5. *Allotria* sp. A group on the left comprises the 18 more or less intact paratypes plus three pins holding broken or missing specimens. On the right hand half of the block the other Chalcidoidea, and the Cynipoid, are pinned; also an aphid and two beetles.

Gijswijt reared six females and six males from *Asphodylia sarothamni* galls which he collected from *Genista cinerea* in Spain. The females differ only in having a some-

what longer malar space/eye ratio: 0.33 (0.3 or slightly shorter in the type specimens).

Biology.— Reared from galls of *Jaapiella genisticola* (Löw) and *Asphodylia sarothamni* (Loew) (Dipt. Cecidomyiidae) and from *Asphondylia sarothamni* on *Genista* spp.

Distribution.— Czech Republic, Spain.

*Torymus geranii* (Walker, 1833)

*Callimome Geranii* (Curtis MS.) Walker, 1833: 121, ♀.

*Torymus geranii*; Boucek, 1977: 26; Boucek & Graham, 1978a: 227; Grissell, 1995: 281.

[*Torymus cynipedis*; Boheman, 1834: 342. Misidentification].

*Torymus cyniphidum* Ratzeburg, 1844: 178, ♂ ♀.

[*Torymus cingulatus*; Thomson, 1876 92-93; Eady, 1959 265; Nikol'skaya & Zerova, 1978: 370; Sellenschlo & Wall, 1984: 23. Misidentifications].

*Torymus lusitanicus* Tavares, 1900: 45, ♂ ♀. **Syn. nov.**

Type material.— *Callimome geranii* Walker: **lectotype**, ♀, (BMNH): here validated, labelled: "*Call. geranii* Walker, lectotype ♀ M. de V. Graham + Z. Boucek det. 1976"; **paralectotypes**: 9 ♀♀ (BMNH), labelled as lectotype.

*Torymus cyniphidum* Ratzeburg: no type designated yet.

*Torymus lusitanicus* Tavares: type material not located.

Comments.— *Callimome Geranii* Walker. Ten specimens were found by Graham standing under the name *cynipedis*, all conspecific.

Boheman (1834: 342) attributed the name *cynipedis* to Fabricius, but Fabricius was merely quoting the Linnean name *Ichneumon Cynipedis* which, from the original description and origin (associated with *Salix*) was clearly not the present species and probably not a torymid.

*Torymus cyniphidum* Ratzeburg: Boucek (1964: 669) found a female in the remnants of Ratzeburg's collection in Eberswalde, labelled "cyniphid. R." He stated that it belonged to *cingulatus* Nees sensu Eady (1959) (= *geranii* Walk.). It was synonymised with *geranii* by Boucek & Graham (1978: 227).

*Torymus lusitanicus* Tavares was reared from galls of *Trigonaspis synaspis* Htg. on *Quercus humilis* Lam. (= *fruticosa* Brot.) near Coimbra Portugal. The description and host leave no doubt that it is the same as *geranii*.

Variation.— Morphological: Askew (1965: 228, as *cingulatus*) found that the ovipositor length was significantly different between females of the spring and autumn generation, though the difference was much less marked than in *nigricornis* (now *auratus* (Müller)). We have measured the ovipositor index in a number of females. Females emerging in May and June have ovipositor index 2.6-3.2. Those emerging in August and September have ovipositor index 2.95-3.3.

Colour: as compared with those of *auratus*, females of *geranii* tend to have the body rather less bright-green or golden-green; the vertex is sometimes more or less bronze to purplish; the pleuron of the mesosoma is often more or less golden to coppery. The pale band of the gaster is sometimes very narrow and obscure in British specimens, usually relatively broad and bright in those from southern and central Europe. The femora and tibiae are more testaceous or reddish-testaceous; occasionally the hind femora and tibiae are weakly infuscate medially in smaller females at length of 2.0 mm or less.

Biology.— Reared from cynipid galls on *Quercus*.

Distribution.— Belgium, Croatia, France, Germany, Great Britain, Netherlands, Poland, Slovakia, Yugoslavia (Serbia).

*Torymus giraudianus* (Hoffmeyer, 1930)

*Callimome giraudianum* Hoffmeyer, 1930a: 25, ♂ ♀, 1930c: 239.

*Torymus giraudianus*; Sellenschlo & Wall, 1984: 25; Grissell, 1995: 281.

*Callimome coccorum* Hoffmeyer, 1930a: 23-24, ♂ ♀, Hoffmeyer, 1930c: 236; Erdős, 1960: 26; Grissell, 1995: 278. **Syn. nov.**

Type material.— *Callimome coccorum* Hoffm.: syntypes, 1 ♂, 1 ♀ (MNHN), on micropins, stayed on a pith block, labelled "Ex cocco minutissimo *quercus* Graz." [Giraud's hand]; "MUSEUM PARIS COLL. GIRAUD 1877", "*Callimome coccorum* m." [Giraud's hand], "*Callimome coccorum* Hoffm. Type ♀ allotype ♂" [in Hoffmeyer's hand], "type" (in red lettering). **Lectotype** the female, is here formally designated, because Hoffmeyer did not designate a holotype in his paper.

*Callimome giraudianum* Hoffm.: **lectotype**, ♀, (MNHN): here designated, labelled "Ex *Cecidom. saliciperdae* Duf. *Pop. alba*" in Giraud's hand; "MUSEUM PARIS COLL. GIRAUD 1877"; "*Callimome giraudianus* [sic] Hoffmeyer Type" in Hoffmeyer's hand; "Type" in red lettering.

Comments.— *Callimome coccorum* Hoffmeyer: the female appears to be conspecific with that of *C. giraudianum* and suggests that the host record from a Coccid might have been a mistake. In view of this, *giraudianus* is adopted as the valid name for the present species.

*Callimome giraudianum* Hoffmeyer: the lectotype female is pinned with a male on a pith block. The provenance of *giraudianum* was not stated; it may have been France (Lorraine).

Biology.— Reared from galls of *Helicomylia saliciperda* (Dufour) (Dipt. Cecidomyiidae).

Distribution.— Austria, France.

*Torymus gloriosus* spec., nov.  
(fig. 112)

Type material.— **Holotype**, ♀, (BMNH) Czech Republic "CSR Bohemia Dolni Poustevna 14-16.8.1959 A. Hoffer." **Paratypes**: (BMNH) 6 ♀ ♀ topotypic; 1 ♀ "Oxon, Bernwood Forest, at Drunkard's Corner, 16.10.1955 M. de V. Graham".

Description of female.— Morphology: head in dorsal view twice as broad as long, temples 0.33-0.34 apparent length of eye; POL 1.77 OOL, OOL 1.37 OD. Vertex finely reticulate with a number of very small but distinct punctures. In frontal view the mouth is 2.4 times malar space which is 0.34-0.35 length of eye. Head transverse-oval, with slightly curved genae; clypeus (fig. ) weakly produced, slightly curved. Antennae (fig. 112) toruli well above eyeline, scape 3.8 times as long as broad, reaching lower edge of anterior ocellus; pedicellus plus flagellum 1.25 times as breadth of head, flagellum proximally slightly stouter than pedicellus, rather weakly clavate; pedicellus twice as long as broad; anellus subquadrate; F1 1.57 times as long as broad, F2-F4 very slightly elongate, F5 and F6 quadrate, F7 very slightly transverse; clava about twice as long as broad; sensilla numerous, uniseriate.



Mesosoma 1.95 times as long as broad, punctures relatively numerous, small, setae short, only slightly raised. Mesonotum 1.1 times as broad as long, finely reticulate, more or less rippled in frontal half. Scutellum 1.35 times as long as broad, sculpture and punctures as on mesoscutum, setae of hind third long; flange very narrow, finely trabeculate. Dorsellum nearly smooth. Propodeum delicately finely superficial alutaceous, with a row of very small fovea along base. Mesepimeron 1.6 times as long as broad, shorter than mid coxa (24:30). Hind coxa 2.1-2.4 times longer than broad, hind edge strongly curved, mainly with rather coarse, slightly raised reticulation, pilose in basal half. Spur of hind tibia 0.47 length of basitarsus. Forewing twice as long as broad; costal cell 10-11 times as long as broad, with one row of setae in distal half on upper side and one row complete row plus scattered setae over distal half on underside, basal cell nearly bare, closed; basal vein with 4-8 setae. Speculum partly open. M:PM:ST=40:10:3.5, stigma subsessile, small.

Gaster slightly compressed, basal sternite long, reaching beyond coxa by nearly half its length; hypopygium reaching two-third to three quarters length of gaster, bare except tip. Ovipositor index 2.0-2.05. Length 2.7-3.1 mm.

Colour: body bright green with strong golden to coppery tinge on vertex and face, on pleuron of mesosoma, on posterior half or more of dorsum of gaster, and on its side. Scape testaceous, infusate dorsally over about distal half. Coxae as mesosoma, fore coxae sometimes partly yellow. Rest of legs yellow-testaceous with paler tarsi, fifth segment of hind and mid tarsi, brown. Hind femur and hind tibia infusate medially in British paratype. Tegulae yellow. Wings hyaline, venation yellowish-testaceous.

Male.— Unknown.

Comments.— The females of *T. gloriosus* have hairy coxae and genae, which are distinctly curved. From the related species it can be distinguished by the strong coppery reflections on meta- and mesosoma.

Biology.— Unknown.

Distribution.— Czech Republic, Great Britain.

*Torymus gracilior* Graham, 1994  
(figs 113-115, 254)

*Torymus gracilior* Graham, 1994a: 21-22, ♀; Grissell, 1995: 282.

Type material.— **Holotype**, ♀, (BMNH): France: Drôme, le Poët-en-Percip, east of Buis-les-Barronies, 15.vii.1991 (Graham). **Paratypes**: 3 ♀♀ (BMNH), same data as holotype; 4 ♀♀ (RMNH, MJG), Gard, Crespian, bank of R. Doulibre, in bushes, 8.vi.1982, M.J. Gijswijt.

Comments.— In the Boheman collection (NR) stands a specimen (lacking head) under *contubernalis*.

Male.— Unknown.

Biology.— Unknown.

Distribution.— France, Italy, Sweden.

*Torymus grahami* Boucek, 1994

? *Torymus inulae* Wachtl, 1884: 6-7, ♂ ♀. (see species inquirendae).

*Torymus grahami* Boucek, 1994: 72-74, ♀; Grissell, 1995: 282.

Type material.— *T. grahami*: **Holotype**, ♀, (BMNH), Czech Rep., Bohemia, Louny district, Listany 27.iv.1946. **Paratypes**: 1 ♀ (NMP), topotypic; 1 ♀ Czech Rep., Bohemia, Slany distr., Vraný nr. Peruc, 26.iv.1946; 1 ♀ (BMNH) U.K., Berkshire, Dorset 30.vi.1965; 1 ♀ (BMNH), Wytham, bank of river Thames, 24.vi.1964; 1 ♀ (BMNH), Wales, Brithdir, nr. Dolgellau, 21.vii.1969.

Comments.— New records: 1 ♀ (MJG) "France, Nièvre M.J. Gijswijt, Chateau Chinon 23-25 viii 1989". 1 ♀ (BMNH) "France Gard nr, Moussargues SE of Clavières (4) 2.8.1973 M, de V. Graham". The specimen from Chateau Chinon has head and dorsum of thorax (not the propodeum) violet-blue, that from Moussargues has head and mesosoma bright-blue. Some females of this species from France and the Czech Republic, having the body partly or mainly violet and the legs mainly reddish yellow, agree very closely with the description of *inulae* Wachtl. One interesting feature is that the setae of the mesoscutum and scutellum are slightly golden instead of whitish. Wachtl mentioned that the scutellum was clothed sparsely with yellowish hairs. Another related species having golden setae is *fischeri* Ruschka.

Biology.— Unknown.

Distribution.— Czech Republic, France, Great Britain.

*Torymus halimi* spec. nov.

Type material.— **Holotype**, ♀, (RMNH): "España Isl. Can. Lanzarote Famara U. Sellenschlo, ectopar. on *Asphondylia conglomerata* on *Atriplex halimium*, ii.1992. **Paratypes**: 3 ♂♂, 6 ♀♀ (MJG, MZH, ZMA), topotypic; 3 ♂♂, 5 ♀♀ (RMNH, MZH, M.J.G), "ESPAÑA Islas Canarias LANZAROTE U. Sellenschlo".

Description of female.— Morphology: head in dorsal view about twice as broad as long, temples 0.29 apparent length of eyes, fairly strongly convex, curved; POL 2.0 OOL, OOL 1.35 OD. In frontal view the head is trapeziform with straight genae. Mouth 1.85-1.95 malar space, which is 0.35 length of eye. Clypeus very slightly produced, weakly curved. Antennae with toruli well above lower eyeline, but slightly nearer to clypeus than to anterior ocellus; scape 4.6 times as long as broad, not quite reaching anterior ocellus; pedicellus plus flagellum 1.23 breadth of head, flagellum proximally slightly stouter than pedicellus, moderately clavate; pedicellus 1.7 times as long as broad; anellus twice as broad as long; F1 longer than broad, following segments quadrate, F7 very slightly transverse; clava slightly more than twice as long as broad; sensilla numerous, uniseriate.

Mesosoma 1.5 times as long as broad. Mesonotum 1.4 times as broad as long, with fine reticulation, more scaly in frontal half, setae short, subdecumbent (nearly as short as in *phillyreae*) punctures very numerous, but minute. Scutellum 1.1 times as long as broad, broadly rounded at base, sculpture as mesonotum, setae short, moderately long in hinder third; flange very narrow, minutely trabeculate. Dorsellum nearly smooth. Propodeum finely alutaceous, with row of very fine fovea at base. Mesepim-

eron 1.45 times longer than broad, shorter than mid coxa (19:24). Hind coxa 2.5 times as long as broad with finely but distinctly raised reticulation, its hind edge strongly curved. Hind femur 3.7 times as long as broad. Spur of hind tibia 0.34-0.36 length of basitarsus. Forewing 2.4 times as long as broad; costal cell 10 times as long as broad, upper surface bare, beneath with one broken row in basal quarter and distal third plus a few scattered setae in the same area; basal vein with two to four setae; basal cell closed below; speculum partly open, extending beyond parastigma; M:PM:ST=76:15.5:6, stigma very shortly petiolate, slightly oblique.

Gaster not compressed; basal sternite extending beyond coxa by about one-third length of latter; hypopygium extending three quarters along gaster, bare except tip. Ovipositor index 2.4-2.6, as long as metasoma plus half mesosoma. Length 1.65-2.4 mm.

Colour: vertex and mesonotum blue with violet in places, metasoma greenish-blue with hinder parts of tergites sometimes more violet. Smaller specimens tend to be more green. Face blue or green; scapus testaceous, dorsally brown. Palpi testaceous. Legs except coxae testaceous, hind tibiae slightly darkened. Fore coxae testaceous except for a small dark spot at base; other coxae green. Wings hyaline, veins yellowish, only ST brown.

Male: differs from female as follows:

Morphology: scape curved, not reaching anterior ocellus; flagellum much stouter than pedicellus, nearly cylindrical in larger specimens, slightly clavate in smaller ones; flagellum thickly clothed with short curved, black setae. Length 1.5-2.3 mm.

Colour: hind femora broadly black, mid femur more or less dark striped beneath, hind tibiae broadly infusate.

Comments.— A European species associated with *Atriplex patula* is *T. schizothecae* Ruschka, the female of which differs from that of *halimi* spec. nov. particularly in its shorter ovipositor (sheaths 1.70-1.83 length of hind tibia and only about as long as metasoma), also in broader scape (slightly more than 3 times as long as broad in *schizothecae*), and a slightly longer malar space (0.37 length of eye in *schizothecae*). *T. schizothecae* has short setae on mesoscutum, like *halimi* and the two may be closely related.

Biology.— Parasite of *Asphondylia conglomerata* Stefani (Dipt. Cecidomyiidae) on *Atriplex halimus* L.

Distribution.— Spain (Canary Islands).

*Torymus hederæ* (Walker, 1833)  
(figs 116-117)

*Callimome hederæ* Walker, 1833: 123, ♀.

*Torymus hederæ*; Eady, 1959: 261, in part; Boucek & Graham 1978a: 227; Grissell, 1995: 282.

Type material.— *Callimome hederæ* Walker: **lectotype** designated by Eady (1959: 261). (BMNH no. 1568).

Comments.— Eady incorrectly placed *speciosus* Boheman in synonymy with *hederæ* Walker. Graham later established the differences between these two species. The study of their respective types and the result was published by Boucek & Graham (1978).

Biology.— Unknown.

Distribution.— France, Great Britain, Netherlands.

*Torymus helveticus* spec. nov.  
(figs 118-119)

Type material.— **Holotype**, ♀, (BMNH): "Switzerland: Vaud, Les Pleiades, 3-4.vi.1959, J.E. & R.B. Benson, B.M. 1959-294". **Paratypes**: 2 ♀♀ (BMNH), same data as holotype; 1 ♀ Czech Republic, "Horní Blatná, o. K[arlov] Vary, Bohemia, Krus. h., Boucek, 6.6.57" (det. as *cupratus*).

Description of female.— Morphology: head in dorsal view (fig. 119) twice as broad as long, temples about 0.2 apparent length of eye. POL 1.9 00L, 00L 1.3 OD. Vertex finely reticulate, piliferous punctures few and minute. In frontal view (fig. ) the mouth is 1.8-1.85 length malar space, the latter 0.4 length of eye. Antenna (fig. 118) with toruli well above lower eyeline, hardly nearer to clypeus than to anterior ocellus; scape four times as long as broad, not quite reaching lower edge of anterior ocellus; pedicellus plus flagellum 1.1 breadth of head, funicle proximally slightly stouter than pedicellus, thickening moderately distally; pedicellus about 1.6 times as long as broad, 1.25 times as long as F1; anellus about 1.5 times as broad as long; F1-F5 quadrate, F6 and F7 (or only F7) very slightly transverse; clava 1.8 times as long as broad; sensilla numerous, uniseriate.

Mesosoma 1.85 times as long as broad. Mesonotum 1.35 times as broad as long; mesoscutum, axillae and scutellum rather dull, with excessively fine reticulation (slightly more scaly on mesoscutum anteriorly), piliferous punctures not developed, the setae arising from minute warts; setae of posterior part of mesoscutum and of scutellum strongly raised, relatively long, other setae shorter and less raised. Scutellum 1.15 times as long as broad, rather narrowly rounded at base; flange very narrow, with weak trabeculae. Dorsellum nearly smooth, with a trace of a median furrow. Propodeum shiny, with delicate very fine superficial alutaceous sculpture. Mesepimeron small, hardly higher than broad, less high than mid coxa. Fore femur with long curved setae. Hind leg with coxa twice as long as broad, with fine though slightly raised reticulation, hind edge strongly curved, pilose dorsally in basal half; femur 3.7 times as long as broad, spur of tibia 0.44 length of basitarsus. Forewing 2.4 times as long as broad; costal cell 10 times as long as broad, upper side with one row, lower side with one row plus many scattered setae over nearly the whole surface; M:PM:ST=64:20:8, stigma shortly petiolate, moderate sized; basal cell pilose on upper half, closed below, basal vein with 5-6 setae, speculum rather narrow, on lower surface of wing much effaced by scattered setae, partly open.

Gaster hardly or slightly compressed, in profile short and high; basal sternite slightly longer than coxa; hypopygium extending at three quarters length of gaster, bare except tip. Ovipositor index 1.0-1.1, sheaths somewhat shorter than gaster. Length 2.2-2.4 mm.

Colour: head mainly purplish-bronze; palpi black. Mesosoma mainly coppery-bronze, mesonotum, axillae and part of scutellum somewhat greenish. Gaster mainly coppery bronze. Antennae black, scape with bronze tinge. Coxae coloured as mesosoma, femora mainly fuscous, rest of legs testaceous, mid and hind tarsi paler basely.

Tegulae black. Wings subhyaline, venation brown to fuscous.

Male.— Unknown.

Comments.— *T. helveticus* females somewhat resemble those of *heyeri* Wachtl, which differ in having the malar space shorter, flagellum proximally not stouter than pedicellus, ovipositor sheaths not shorter than gaster, index 1.3-1.6, antennal scape usually pale beneath, head and mesosoma bronze-green or bronze. The females of *T. apiomyiae* Boucek & Mihajlovic, which much resemble *helveticus* in colour of the body and sculpture of mesosomal dorsum, differ from it in absence of speculum, larger stigma, broader costal cell, and paler legs.

Biology.— Unknown.

Distribution.— Czech Republic, Switzerland.

*Torymus heterobiae* spec. nov.

(fig. 255)

Type material.— **Holotype**, ♀, (BMNH): England, "England, Kings Wood H.F. Barnes, 22/12/52/6, ex *R. heterobia* 2-21.vii.1925".

Description of female.— Morphology: head in dorsal view 2.15 times as broad as long, temples 0.26 apparent length of eye, rather strongly converging, curved. POL 1.9 OOL, OOL 1.1 OD. Vertex finely, partly wrinkled reticulate, with several very small punctures on upper face, and several larger ones in ocellar triangle. In frontal view the head is subtrapeziform, with very weakly curved genae. Clypeus see fig. 255. Antennal toruli well above lower eyeline but slightly nearer to clypeus than to anterior ocellus; scape 3.2 times as long as broad, not nearly reaching anterior ocellus; pedicellus plus flagellum 1.3 times breadth of head, flagellum proximally slightly stouter than pedicellus, weakly clavate; pedicellus 1.7 times as long as broad; anellus 1.5 times as broad as long; F1 and F2 slightly longer than broad, F3-F6 quadrate, F7 very slightly transverse; clava 2.2 times as long as broad; sensilla numerous, uniseriate.

Mesosoma 1.8 times as long as broad, notauli moderately deep. Mesoscutum nearly as broad as long, finely sculptured, tending to ripple-scaly except in posterior third; punctures very small but numerous, separated by about twice their diameter, setae slightly raised and of normal length. Scutellum 1.25 times as long as broad with broadly rounded subtruncate base, punctures numerous, very slightly larger than those on mesoscutum, setae on hind third long, flange narrow, finely trabeculate. Dorsellum nearly smooth, with distinct median sulcus. Propodeum very finely delicately alutaceous, nearly smooth medially, with a small row of fovea. Mesepimeron 1.65 times as high as broad, shorter than mid coxa. Hind leg with coxa 2.1 times as long as broad strongly curved, with finely, slightly raised sculpture in basal half, rest with engraved sculpture, pilose in basal half; femur 3.75 times as long as broad; spur of tibia 0.4 length of basitarsus. Forewing 2.5 times as long as broad; costal cell 10 times as long as broad, above with one complete row, below with one row plus scattered setae, except in the middle; basal cell with two setae below SM, closed; basal vein with four setae; speculum extending somewhat beyond parastigma, open in basal half. M:PM ST=41:12:5; ST shortly petiolate, moderately oblique.

Gaster slightly compressed; basal sternite extending slightly beyond coxa; hypo-

pygium extending three quarters along gaster, bare except tip. Ovipositor index 2.1, sheaths as long as metasoma plus one-third mesosoma. Length 3.2 mm.

Colour: body bright bluish-green, with slight brassy or coppery tinge on vertex, genae, mesoscutum and pleuron of mesosoma. Palpi testaceous. Antennae black, scape testaceous beneath in basal half. Coxae, and hind femora except at bases and tips, coloured like body; fore and mid femora slightly infuscate in proximal half; rest of legs testaceous with fifth tarsal segment brown. Tegulae yellow. Wings hyaline, venation testaceous.

Male.— Unknown.

Comments.— *T. heterobiae* differs from females of *fractiosus*, *galeobdolonis*, *epilobii*, and *pastinacae* in the characters given in the key to females. From female *fractiosus* it also differs in its relatively shorter ovipositor; from *galeobdolonis* in its somewhat longer flagellum; from female *epilobii* and *pastinacae* in having piliferous punctures of mesonotum and scutellum more distinct.

Biology.— Parasite of *Rabdophaga heterobia* (Loew), (Dipt., Cecidomyiidae) on *Salix*.

Distribution.— Great Britain.

*Torymus heyeri* Wachtl, 1833  
(figs 120-121)

*Torymus heyeri* Wachtl, 1833: 35-36, ♂ ♀; Györfi, 1962: 210; Boucek, 1977: 26; Sellenschlo & Wall, 1984: 25; Grissell, 1995: 282.

*Callimome heyeri*; Hoffmeyer, 1930c: 239.

Type material.— **Lectotype** designated, here validated, the left-hand specimen of two females on the same mount, labelled "LECTOTYPE (left ♀) *Torymus heyeri* Wachtl. M.J. Gijswijt 1993".

Comments.— *Torymus heyeri* Wachtl: there are four mounts under this name in NHMW, each mount bearing two specimens. The species was described from Bohemia but Wachtl did not say how many specimens he had.

Biology.— Parasite of *Dasineura abietiperda* Henschel on *Picea excelsa* and *Thecodiplosis* sp. on *Picea nigra*.

Distribution.— Croatia, Czech Republic, Germany, Italy, Netherlands, Spain, Switzerland, Yugoslavia.

*Torymus hornigi* Ruschka, 1921  
(fig. 122)

*Torymus Hornigi* Ruschka, 1921: 338, ♀; Sellenschlo & Wall, 1984: 25; Grissell, 1995: 282.

Type material.— **Holotype**, ♀, (NHMW) here designated. It is labelled "Austr. inf. Annaberg 14.4.80 Wachtl; Type [a red bordered circular label]; 26; *Torymus hornigi* Ruschka, Type".

Comments.— The holotype female of *hornigi* was located in Forstinstitut, Vienna (Wachtl collection) and has been transferred to NHMW Vienna. It is pinned with a minutien pin, stayed on a pith block, together with a similar pinned specimen of its

dipterous host. The specimen is in good condition. The characters used in our key are drawn from the holotype; no other material has been seen.

Biology.— Reared from galls of *Gisonobasis origani* (Wachtl) (Dipt. Cecidomyiidae) in swollen flowers of *Origanum vulgare*.

Distribution.— Austria.

*Torymus hylesini* Graham, 1994  
(figs 123-124)

[*Torymus bohemani*] [sic]; Hedqvist, 1963:49-50, misidentification].

[*Torymus bohemani*]; Sellenschlo & Wall, 1984:23, misidentification].

*Torymus hylesini* Graham, 1994a: 29-31, ♂ ♀; Grissell, 1995: 282.

Type material.— **Holotype**, ♂, (BMNH): Great Britain: "Hampshire, New Forest, 8.vi.1969, on a tree bole (J. Brock)". **Paratypes**: 6 ♂♂ (BMNH): same data as holotype, 19 ♂♂, 31 ♀♀ (BMNH), "Surrey, Ranmore Common, near Dorking, reared spring 1936 from *Leperesinus varius* (F.) (O.W. Richards)"; Czechoslovakia: Velky Vrestov, 3 ♂♂, several ♀♀ (BMNH, ZB) on *Fraxinus* logs with *L. varius* (Z. Boucek).

Biology.— Reared from *Leperesinus varius* (F.) (Coleoptera, Scolytidae) in *Fraxinus* logs.

Distribution.— Czech Republic, France, Great Britain, Sweden.

*Torymus igniceps* Mayr, 1874  
(figs 125-127, 256)

[*Torymus bedeguaris* Boheman, 1834: 350-352. Misidentification].

*Torymus igniceps* Mayr, 1874: 103-104, ♂ ♀; Grissell, 1995: 282.

*Callimomus igniceps*; Thomson, 1876: 78; Hoffmeyer, 1930c: 235; Boucek, 1954: 62; Nikol'skaya & Zerova, 1978: 368; Sellenschlo & Wall, 1984: 19.

[*Torymus chrysocephalus*; Mayr, 1874: 89-90 (♂); Nikolskaya & Zerova, 1978: 368. Misidentification].

Type material.— Five syntypes of *T. igniceps* are in NHMW. A female, here designated **lectotype**, is mounted on a minutien pin and labelled: "Aachen Fr; f; 20; Collect. G. Mayr; *Tor. igniceps* Myr det. Förster [sic]". The left antenna is broken off beyond F5. The other syntypes are designated **paralectotypes** (NHMW).

Comments.— Two specimens stand under the name *bedeguaris* (L.) in Boheman's collection. The first is a female of *igniceps*, the second a male of *scaposus* (Thomson). Thomson (1876: 65) pointed out in a Swedish footnote that Boheman had misidentified *bedeguaris*. In the Zetterstedt collection (ZIL) there are two specimens identified as *bedeguaris* by Boheman; one is a ♀ *igniceps*, the other, a ♂, probably the same species.

This very distinctive species is easily recognized.

Biology.— Most probably a parasite of a host on *Carex* in marshy places.

Distribution.— Czech Republic, Great Britain, Italy, Netherlands, Sweden.

*Torymus impar* Rondani, 1877.  
(fig. 128)

*Torymus impar* Rondani, 1877: 201-202, ♂ ♀; Boucek, 1974: 252-254; Grissell, 1995: 282.

*Callimome bakkendorfi* Hoffmeyer, 1933: 246, ♀; Heliën, 1934: 188.

*Torymus* sp. near *borealis* Thomson; Graham, 1969: 62.

Type material.— *Torymus impar* Rondani: **lectotype** ♀ (SFI), designated by Boucek (1974: 252).  
*Callimome bakkendorfi* Hoffmeyer. Holotype and paratype examined by Boucek and placed in synonymy with *impar* Rondani (Boucek, 1974: 252, 275).

Biology.— Reared from galls of *Rabdophaga rosaria* (Loew) (Dipt. Cecidomyiidae) on *Salix* spp.

Distribution.— Denmark, Finland, Germany, Great Britain, Italy, Netherlands, Poland.

*Torymus imperatrix* spec. nov.  
(figs 129-131)

Type material.— **Holotype**, ♀, (RMNH): "Italia-Mar., prov. Macerata, M.J. Gijswijt, Fiastra 1000 m Acquacarina 26.v.1993". **Paratypes**: 15 ♀♀ + 4 ♂♂, (MJG, RMNH, ZMA), topotypic; 2 ♂♂ (MJG), "ITALIA Fm-Ro prov. Forli M.J. Gijswijt, S. SOFIA Campigna 900 m 17.v.1993"; 1 ♀, (BMNH), Italy, Duino (Tasso), 12.v.1931; 1 ♀ (BMNH), "Schatzmeyr, Koch"; 1 ♀, (BMNH), "Matera, 16.v.1925, Schatzmeyr"; 11 ♂♂ (BMNH), "Yugoslavia: Istria, Jakovici, 27.iv.1975, swept from clover meadow, J.S. & M.E. Noyes"; 5 ♀♀ (BMNH), "Yugoslavia: Istria, Markoviscina, 2.v.1975, swept from grassland, J.S. & M.E. Noyes"; 3 ♂♂, 2 ♀♀ (BMNH), "Yugoslavia: Istria, Marcana-Vareski, 3.v.1975, swept from *Lotus*, *Orchis* and *Dactylorhiza* meadow, J.S. & M.E. Noyes"; 12 ♂♂, 6 ♀♀ (BMNH), "Yugoslavia: Slovenia, Lokev, 2.v.1975, swept from grassland, J.S. & M.E. Noyes"; 17 ♂♂ (BMNH), "Yugoslavia: Slovenia, Kosina, 2.v.1975, swept from grassland, J.S. & M.E. Noyes"; 1 ♀ (BMNH), Yugoslavia, "Durmitor, Zabljak env.: Crna Gora, 25.6-7.7.1958, Boucek" [det. as "*arcticus* (Th.)"]; 1 ♀ (BMNH), Czech Republic, "Mor. [Moravia] merid., Pouzdrany, 1936, A. Hoffer" [det. as "*arcticus*"]; 1 ♀ (BMNH), Hungary, "Budapest Hung. 25.5.64 Strejcek" [det. as "*arcticus*"].

Description of female.— Morphology: differs from that of *T. austriacus* Graham as follows.— POL 1.3-1.6 OOL; OOL only 2.0-2.1 OD. Antenna (fig. 129): F1 1.5-1.7 times as long as broad, about as long as pedicellus, not constricted proximally. Scutellar frenal area (fig. 131) often polished and smooth, but with 4-9 scattered piliferous punctures. Mesepimeron as large as in *T. formosus* (Walker) and nearly square [*austriacus* also has a large mesepimeron, but this was not mentioned in the original description]. Forewing: upper surface of costal cell sometimes with a few setae apically; basal vein with 2-5 setae; basal cell usually partly closed below by a few setae; speculum, on lower surface of wing, often with some scattered setae. Ovipositor index 1.45-1.65, sheaths slightly shorter than or as long as gaster. Length of body 2.1-3.6 mm.

Colour: head bronze. Antennae black, scape greenish-blue to brassy tinged. Mesosoma sometimes blue-green with brassy tinge in places, sometimes partly to mainly bronze. Sides of propodeum and upper part of mesopleuron coppery; sometimes also pronotum. Legs coloured like body but tips of fore and mid femora, fore tibiae, bases and tips of mid and hind tibiae testaceous; hind coxae and all femora more or less coppery tinged. Mid and hind tarsi testaceous proximally, gradually



darkening to fuscous at tips. Middle third of forewing at least very lightly infumate. Gaster green basally, otherwise purplish, or dark blue and purplish.

Description of male.— Differs from female as follows:

Morphology: POL 1.15-1.4 OOL. Antennae (fig. 130) with scape about 4.5 times as long as broad, reaching lower edge of anterior ocellus, with an angular projection at its lower end; pedicellus 1.6-1.8 times as long as broad, as long as or slightly shorter than F1; anellus slightly transverse; pedicellus plus flagellum 1.85-2.0 times breadth of head, flagellum cylindrical or nearly so, proximally slightly stouter than pedicellus, densely clothed with curved, black, subdecumbent setae; funicular segments decreasing slightly in length, F1 1.3-1.75 times, F7 1.0-1.1 times as long as broad; clava about 2.5 times as long as broad, as long as or slightly longer than F6+F7.

Mesoscutum and scutellum less shiny, with more distinct reticulation. Scutellum with frenal area mainly alutaceous. Mesepimeron not quite so large as in female. Forewing: costal cell broader, its upper surface with a row of setae which is nearly complete, or widely broken medially; lower surface with a complete row, plus one extra row in basal quarter and two extra rows in distal quarter; basal cell bare or with 1-6 setae, basal cell closed below; speculum, on lower surface of wing, with some scattered setae.

Gaster oval, narrower and shorter than mesosoma. Length 1.8-3.0 mm.

Colour: body dark blue-green to bronze-greenish, sometimes partly coppery; upper part of mesopleuron always coppery, sometimes also posterior half of gaster. Femora not coppery tinged. Forewing weakly infumate, or hyaline.

Comments.— From the only other species in the species-group *austriacus*, this species can be distinguished by the characters mentioned in the key to females.

Biology.— Unknown.

Distribution.— Croatia, Czech Republic, Hungary, Italy, Slovenia, Yugoslavia (Montenegro).

*Torymus janetiellae* spec. nov.  
(figs 132-133)

Type material.— **Holotype**, ♀, (RMNH): Netherlands, "Wageningen iii.1972, W.C. Nijveldt, depot 279 op kegels v. *Chamaecyp. laws.* m. *Craneiobia laws.* coll. 23.ii.1972". **Paratypes**: 3 ♂♂, 4 ♀♀ (BMNH, MJG) same data as holotype; 3 ♂♂, 2 ♀♀ (ZMA), "Wageningen ii.1982, W.C. Nijveldt, coll. 1.x.1980, /cones of *Chamaecyparis lawsoniana* with *Janetiella siskiyou* Felt"; 2 ♂♂, 2 ♀♀ (MJG, RMNH) "Wageningen, spring 1983, W.C. Nijveldt, /cones of *Chamaecyparis lawsoniana* with *Janetiella siskiyou* Felt"; 1 ♂ (MJG) "Naarden, ii.1981, S. v. Heynsbergen, /*Janetiella siskiyou* in *Chamaecyparis lawsoniana* coll. i.1981".

Description of female.— Morphology: head in dorsal view about twice as long as broad, with temples 0.34 apparent length of eyes, moderately converging, curved. POL 1.85 OOL, OOL 1.22-1.24 OD. Vertex minutely alutaceous with scattered minute punctures. In frontal view (fig. 132) the head is subtrapeziform with very slightly curved genae. Clypeus very slightly produced, subtruncate. Mouth 2.0-2.2 times malar space, the latter 0.33-0.34 length of eye. Antennae with toruli well above lower eyeline, hardly nearer to clypeus than to anterior ocellus; scape 3.7 times as long as broad, nearly or just reaching lower edge of anterior ocellus; pedicellus plus flagellum 1.32 breadth of head, flagellum proximally hardly stouter than pedicellus, but

moderately clavate; pedicellus 1.6 times as long as broad; anellus very slightly transverse; F1 1.4 times as long as broad, F2 very slightly elongate or quadrate, F3-F6 quadrate, F7 very slightly transverse; clava twice as long as broad; sensilla rather sparse, uniseriate.

Mesosoma 1.8 times as long as broad. Mesonotum 1.2 times as broad as long, finely sculptured, rippled in frontal third, dull, punctures minute and indistinct, setae rather short, slightly raised. Scutellum 1.4 times as long as broad (fig. 133) narrowed basally, rounded, sculpture as mesonotum punctures extremely small though visible, setae in hinder third long; flange extremely narrow, minutely trabeculate. Dorsellum nearly smooth. Propodeum very finely delicately alutaceous, smoother medially, row of fovea very small. Mesepimeron 1.5 times as high as broad, shorter than length of mid coxa (16:20). Hind legs with coxa 2.6 times as long as broad, its hind edge moderately curved, sparsely hairy, mainly with somewhat coarse, slightly raised reticulation; femur 4.1 times as long as broad; spur of tibia 0.4 length of basitarsus. Forewing 2.5 times as long as broad; costal cell about 10 times as long as broad, above with one row, below with one row plus some scattered setae in the middle; basal cell with a row of setae below SM, closed; basal vein with 4-6 setae; speculum partly open, extending slightly beyond parastigma. M:PM:ST= 66:15.5:6.5, stigma shortly petiolate, somewhat oblique.

Gaster slightly compressed, basal sternite extending slightly beyond coxa; hypopygium extending three-quarters along gaster, bare except tip. Ovipositor index 2.0-2.4, as long as metasoma plus half mesosoma. Length 2.1-2.2 mm.

Colour: bright green to blue-green; pleuron of mesosoma sometimes slightly golden. Antennae black, scape testaceous beneath. Coxae, and hind femora except basis and tip as body; fore and mid femora more or less infusate proximally; hind tibiae very broadly infusate; rest of legs yellowish-testaceous only fifth tarsal segments fuscous. Tegulae yellow with hind border broadly fuscous. Wings hyaline, venation testaceous.

Male.— Differs from female as follows: scape not reaching anterior ocellus, externally minutely granulate; pedicellus plus flagellum 1.18-1.35 times longer than breadth of head; flagellum proximally slightly stouter than pedicellus, clothed with short curved black setae, weakly clavate; pedicellus hardly longer than broad, F1 about as long as pedicellus, quadrate, very slightly shorter than F2; F2-F3 quadrate, rest of funicular segments very slightly transverse, sensilla sparse. Scape black. All femora mainly black.

Comments.— It is possible that the species is imported with *Chamaecyparis* seeds. Another species known from cones of *Chamaecyparis* in California is *Torymus festivus* Hobbs. Through the kindness of Dr. E. Grissell, Washington the second author was able to study paratypes and other material of that species. It differs mainly from *janetiellae*: by the longer ovipositor, smaller OOL/POL ratio and the sculpture on the dorsal side of mesosoma which is regular with isodiametric areoles in *festivus* and more irregularly rippled in *janetiellae*. It is possible that the species is imported in Europe from Japan together with *Chamaecyparis* species from that region.

Biology.— Reared from cones of *Chamaecyparis* spp. with *Janetiella siskiyou* Felt (Dipt. Cecidomyiidae).

Distribution.— Netherlands.

*Torymus juniperi* (Linnaeus, 1758)  
(figs 134, 257)

*Ichneumon juniperi* Linnaeus, 1758: 567.

*Torymus juniperi*; Mayr, 1874: 109; Boucek & Graham, 1978a: 22'; Sellenschlo & Wall, 1984: 26, 103; Grissell, 1995: 282.

*Callimome juniperi*; Hoffmeyer, 1930c: 239.

*Callimome Maestus* Walker, 1833: 133, ♂.

*Torymus amethystinus* Boheman, 1834: 370-371, ♀; Thomson, 1876: 85-86.

? *Torymus Kaltenbachi* Foerster, 1840: xxxi, ♀.

*Callimome solinus* Walker, 1848: 153, ♂.

*Torymus budensis* Erdős, 1956: 183, ♀; Grissell, 1995: 277. **Syn. nov.**

Type material.— *Ichneumon juniperi* L. No material has been found either in the Linnaean collection (Linnean Society, London) or in NR.

*Callimome Maestus* Walker and *Callimome solinus* Walker: **lectotypes** ♂♂ (BMNH), designated by Eady, 1959: 261 who correctly placed them in synonymy with *juniperi* (L.).

*Torymus amethystinus* Boheman: Graham found no material under this name in Boheman 's collection (NR) in 1959.

*Torymus kaltenbachi* Foerster: no type material could be found in NHMW.

*Torymus budensis* Erdős: **lectotype**, ♀, (HNHM): selected by Graham, 1973, selection validated by Thuroczy (1992: 131).

Comments.— *Ichneumon juniperi* L.: there seem little doubt that the generally accepted interpretation of this species is correct.

*Torymus amethystinus* Boh.: Mayr (1874: 109) doubtfully synonymised *amethystinus* with *juniperi* L. The description applies very well to some females of *juniperi*, as does Thomson's redescription of *amethystinus* (1876: 85-86). If the original material (possibly a holotype) is not found, Thomson 's interpretation can be followed.

*Torymus budensis* Erdős: It is considered to be the same as *juniperi* (L.). We are informed that *Juniperus* grows in the type-locality of *budensis*.

The egg was described by Sellenschlo & Wall (1984: 103).

Biology.— Reared from galls of *Oligotrophus juniperinus* (L.) (Dipt, Cecidomyiidae) on *Juniperus communis*. It is often found on *J. oxycedrus* as well.

Distribution.— Austria, France, Great Britain, Hungary, Italy, Spain, Sweden.

*Torymus laetus* (Walker, 1836)  
(figs 135-138, 258)

[*Torymus purpurascens* Boheman, 1834: 553-354; Mayr, 1874: 124-125. Misidentification].

*Callimomus purpurascens*; Thomson, 1876: 78-79; Hoffmeyer, 1930c: 235; Nikol'skaya & Zerova, 1978: 368.

?*Callimome rufipes* Walker, 1834: 160, ♀; Grissell, 1995: 287.

*Callimome laetus* Walker, 1836, 136, ♂.

*Torymus laetus*; Boucek, 1977: 26; Grissell, 1995: 283.

*Torymus rufipes* Foerster, 1840: xxx, ♂. **Syn. nov.**

*Torymus congruens* Foerster, 1840: xxx, ♀. **Syn. nov.**

*Torymus hormomyiae* Kieffer, 1899a: 368-369, ♀; Grissell, 1995: 282. **Syn. nov.**

Type material.— *Callimome rufipes* Walker: no material found.

*Callimome laetus* Walker: **lectotype**, ♂, (BMNH): type no. Hym. 5.1603, designated by Eady (1959: 258).

*Torymus rufipes* Foerster: no original material located.

*Torymus congruens* Foerster: **neotype**, ♀, (RMNH): here designated. Labelled: "Förster Aken, Museum Leiden *Torymus congruens* Förster, Museum Leiden *Callimonus* [sic] *purpurascens* Boh."

*T. hormomyiae* Kieffer: **lectotype**, ♀, (MNHN): here designated "*Torymus hormomyiae*" [Kieffer's hand], and a second label: "lectotype of *Torymus hormomyiae* Kieffer 1899 = *scaposus* (Th.) det Z. Boucek 1975".

Comments.— *Callimome rufipes* Walker: the description agrees rather well with female *laetus*. Original material "Taken near Paris, by M.F. de Laporte".

*Callimome laetus* Walker: Walker (1846: 18) placed *laetus* as a synonym of "*purpurascens* Boheman" but that was not a Boheman species ( see under *T. erucarum*). He had seen Boheman's material, as reported by Mayr (1874: 125). Boheman had both sexes of *laetus* misidentified as *purpurascens*.

*Torymus rufipes* Foerster: synonymised with "*purpurascens* Boheman" by Mayr (1874:124). We consider the species to be identical with *laetus* (Walker).

*Torymus congruens* Foerster: no original material located in NHMW. In RMNH stand a male and a female on one minutien pin fixed on a pith block. They originate from Foerster and were sent by him to Snellen van Vollenhoven, curator in the Rijksmuseum voor Natuurlijke Historie in Leiden.

*Torymus hormomyiae* Kieffer: a single mutilated female was found in Kieffer's collection in Bitch, by Mr. H.J. Vlug. Only the mesosoma, both fore coxae, and the left mid coxa, remain. From the description, propodeal sculpture, and remaining characters of the lectotype, it clearly belongs either to *laetus* (Walker) or to *scaposus* (Thomson). We disagree with Dr. Boucek's identification. The propodeal spiracles of the lectotype are smaller than in *scaposus*, but agree with some females of *laetus*, in which the spiracles vary in size. Moreover, Kieffer (1899) indicated nothing remarkable about the antennal scape, which is subclavate in *scaposus*. We are confident in attributing *T. hormomyiae* to *T. laetus* (Walker).

Biology.— Reared from galls of gallmidges (? *Planetella arenariae* (Rübsaamen)) on *Carex*.

Distribution.— Probably the whole of Europe (and may be present outside that in the Palaearctic). Very common, in damp areas with *Carex* species.

*Torymus lampros* Graham 1994

(fig. 139)

*Torymus lampros* Graham, 1994a, ♀; Grissell, 1995: 283.

Type material.— **Holotype**, ♀, (BMNH): Great Britain: Oxfordshire, Otmoor, 12.viii.1956, swept from foliage of *Salix fragilis*. **Paratypes**: same locality as holotype, 2 ♀♀, 6.viii.1956, 3 ♀♀, 12.viii.1956.

Biology.— Unknown.

Distribution.— Great Britain.

*Torymus lapsanae* (Hoffmeyer, 1930)

*Callimome lapsanae* Hoffmeyer, 1930a 26, ♂ ♀.

*Torymus lamsanae* Tryapitzin, 1978: 374. Misspelling.

*Torymus lapsanae*; Sellenschlo & Wall, 1984: 26; Grissell, 1995: 283.

Type material.— **Lectotype**, ♀, (MNHN): here designated, stayed on a pith block together with a male, labelled "en aul. *lapsanae* 1 juin" (in Giraud's hand); "MUSEUM PARIS COLL. GIRAUD 1877".

**Paralectotypes**: 4 ♂♂ and 1 ♀ (MNHN), similarly labelled, also on minutien pins on pith blocks are here designated.

Comments.— The female is close to that of *chloromerus* (Walker) but has a shorter hind tibial spur, the legs are rather apler, with the fore coxae yellow in distal half, mid femora with at most a fuscous streak beneath, fore and hind femora with a greenish flush externally (but not darkened).

The name of the host (*Phanacis lamsanae* (Perris) Hym. Cynipoidea) was thus spelled, but Hoffmeyer consistently used the form *lapsanae* both for the host and the *Torymus* parasite. Hence no emendation of Hoffmeyer's name is justified.

Biology.— Reared from galls of *Timaspis lapsanae* Perris (Hym. Cynipoidea) on *Lapsana communis*.

Distribution.— France.

*Torymus laricis* Boucek, 1994  
(figs 140-141)

*Torymus laricis* Boucek, 1994:74-78, ♂ ♀; Grissell, 1995: 283.

Type material.— **Holotype**, ♀, (BMNH): Czech Rep. Radotin SW of Prague, 20.v.1971, V. Skuhřavy. **Paratypes**: 5 ♀♀, 1 ♂ (BMNH, NMP), topotypic; 2 ♀♀, 1 ♂ (BMNH, NHMW), Austria, Niedere Tauern, ex *D. laricis*, 1963 (A. Kurir); 3 ♀♀ (BMNH, NHMW), Austria, Styria, vi and vii.1969.

Biology.— Reared from galls of *Dasineura laricis* (Loew).

Distribution.— Austria, Czech Republic.

*Torymus lathyri* spec. nov.

Type material.— **Holotype**, ♀, (BMNH): "ex gall on *Lathyrus pratensis*, Great Britain: Hunts: nr. Sixpenny Handle (recte Handley) gall coll.: 8.8.1988 D.G. Nolton".

Description of female.— Morphology: the head is somewhat shrunken and distorted so that some dimensions cannot be accurately measured. Vertex with fine reticulation and with scattered punctures. Mouth 2.29 times malar space, the latter 0.31 length of eye. Clypeus hardly produced, very slightly curved. Antenna with toruli distinctly above lower eyeline; scape probably not reaching anterior ocellus; pedicellus plus flagellum about 1.4 times breadth of head, flagellum proximally hardly stouter than pedicellus, moderately clavate; pedicellus 1.6 times as long as broad; anellus distinctly transverse; F1 slightly longer than broad, apparently with only one sensillum, F2 as long as F1, other segments quadrate; clava 1.8 times as long as broad; sensilla sparse, uniseriate.

Mesosoma 1.75 times as long as broad, rather dull, finely reticulate, in front more rippled. Mesonotum 1.4 times as broad as long, with numerous minute punctures, setae of average length, slightly raised. Scutellum 1.35 times as long as broad, with rounded base, sculpture as mesonotum, setae on hinder third longer and distinctly raised; flange very narrow, indistinctly trabeculate. Dorsellum slightly reticulate. Propodeum delicately alutaceous, row of fovea minute. Mesepimeron shorter than mid coxa (12:15). Hind coxa nearly three times as long as broad, its hind edge only moderately curved, with rather coarse, slightly raised reticulation and with four setae in basal half. Forewing 2.2 times as long as broad; costal cell 10 times as long as broad, above with one nearly complete row, below with one row of setae plus scattered setae except in the middle; basal vein with 4-5 setae; basal cell bare, closed in apical two-third; speculum extending somewhat beyond parastigma, partly closed. M:PM=51:12, stigma very small, distinctly petiolate.

Gaster hardly compressed, basal sternite extending somewhat beyond coxa; hypopygium extending two-third along gaster, bare except tip. Ovipositor index 1.4, slightly shorter than gaster. Length 1.75 mm.

Colour: blue; gaster violet flecked in basal half. Antennae black, scape blue, testaceous beneath. Coxae, femora (except bases and tips) and hind tibiae mainly black, mid tibiae dark. Rest of legs pale yellowish, fifth tarsal segments brown. Tegulae yellowish in front, otherwise fuscous. Wings hyaline, venation pale greyish to testaceous.

Male.— Unknown.

Comments.— The female of *T. lathyri* closely resembles those of *T. corni* Mayr and *T. genisticola* Ruschka but these have longer ovipositors (index 1.65-1.87). The flagellum of *lathyri* appears to be rather shorter than in *corni*. From *T. galii* Boh. it seems to differ by its (sometimes only slightly) shorter ovipositor, the complete hairrow on upper side of the costal cell and the host.

Biology.— Reared from a gall of *Dasineura lathyricola* (Rübsaamen)(Dipt. Cecidomyiidae) on *Lathyrus pratensis*.

Distribution.— Great Britain.

*Torymus longicalcar* Graham, 1994  
(figs 142-146)

[*Torymus incertus* Foerster; Mayr, 1874: 94-95; Erdős, 1955: 182-183. Misidentification].  
*Torymus longicalcar* Graham, 1994e: 122-124, ♂ ♀; Grissell, 1995: 283.

Type material.— **Holotype** of *T. longicalcar*: ♀, (NHMW), designated by Graham (1994e). **Paratypes**: 59 ♀ ♀, 38 ♂ ♂ (NHMW, MJG, TMA), designated by Graham (1994e).

Biology.— Reared from galls of *Dryomyia concinna* Mayr and *Pediaspis aceris* (Foerster) on *Acer* spp. and from *Dryomyia circinans* on *Quercus*.

Distribution.— Austria, Denmark, Germany, Greece, Hungary, Italy, Switzerland, Slovakia.

*Torymus lythri* Boucek, 1994  
(fig. 147)

*Torymus lythri* Boucek, 1994: 78-79, ♂ ♀; Grissell, 1995: 283.

Type material.— **Holotype**, ♀, (BMNH): Austria, Hoff (nr. Salzburg), ex gall on *L. salicaria*, 27.vii.1981 (Scheibelreiter, CIE). **Paratypes**: 3 ♀ ♀, 5 ♂ ♂ (BMNH, NMP, NHMW), topotypic; 2 ♀ ♀, 1 ♂ (NMP, NHMW), same locality but 5.viii.1981.

**Biology**.— Reared from galls in fruit of *Lythrum salicaria*, caused by a cecidomyid midge.

**Distribution**.— Austria.

**Comments**.— According to Boucek (1994) the species comes nearest to *microstigma*; it also resembles *galii* Boheman but differs in having a blue, violet tinged thorax, paler legs, POL about 1.8 OOL (1.9-2.15 in *galii*), distal segments of funicle not transverse (slightly so in *galii*), the head is more transverse, the wing just beyond speculum is more sparsely pilose. The host plant is different.

*Torymus microcerus* (Walker, 1833)  
(figs 148-149)

*Callimome microcerus* Walker, 1833: 128-129, ♂; 1848: 102; Eady, 1959: 269.

*Torymus microcerus*; Grissell, 1995: 284.

*Callimome Aerope* Walker, 1844: 182, ♂; Grissell, 1995: 274. **Syn. nov.**

*Callimome insolitus* Walker, 1874a: 313, ♀; Grissell, 1995: 282. **Syn. nov.**

*Torymus insolitus*; Boucek & Graham, 1978a: 227.

*Torymus liogaster* Thomson, 1876: 98, ♂ ♀; Graham, 1969: 67; Hansson, 1992: 11. **Syn. nov.**

*Callimome liogaster*; Hoffmeyer, 1930c: 243.

*Torymus saliciperdae* Ruschka, 1921: 342, ♂ ♀; Sellenschlo & Wall, 1984: 28. **Syn. nov.**

*Callimome saliciperdae*; Hoffmeyer, 1930c: 244.

*Callimome henrikseni* Hoffmeyer, 1930: 243, 253-254, ♀. **Syn. nov.**

*Torymus hendrikseni*; Grissell, 1995: 282.

Type material.— **Neotype** of *Callimome microcerus* Walker, ♀, (BMNH) is here designated. It is labelled "NEOTYPE" "FRANCE, P./DOME, Gergovie (2)18.7.1977" "M. de V. Graham" "[on underside] microcerus ♀ neotype".

*Callimome Aerope* Walker: no original material has been traced.

*Callimome insolitus* Walker: **lectotype**, ♀, (BMNH): here designated, registered as Type Hym. 5.30; labelled "*Callimome insolitus*" in Walker's handwriting.

*Torymus liogaster* Thomson: the **lectotype**, ♀, (ZIL), was designated by Graham (1969: 67); it is labelled "Hbg" [Hälsingborg] and "*liogaster*" in Thomson's handwriting; registered as type number 1546: 1 (Hansson, 1992: 11).

*Torymus saliciperdae* Ruschka: **lectotype**, ♀, (NHMW): here designated, mounted with another female and two males on a pith block and labelled "*Rh. saliciperda* Umg. Prag, 262i" "Boh. Baudys", "*saliciperdae* m. det Ruschka". **Paralectotypes**: all here designated: the other female and the two males on the block with the lectotype, 3 ♀ ♀ (NHMW), mounted on one pith block and labelled "*saliciperda* Eisgrub 1916 Fulmek", "*saliciperdae* m. det. Ruschka"; 1 ♂ and 1 ♀ (BMNH) mounted on one pith block, labelled "Hostivar b. Prague, 6.3.13. ex *Rhabd. saliciperda* on *Salix amygdalina*; Baudys" (the ♀ has the end of the antennae broken off); 1 ♂ and 1 ♀ (lacking head) (FI) on a pith block labelled "Austr. inf. Pötzlinsd. 30.5.99. Wachtl; 53; *Torymus saliciperdae* Ruschka type"; 1 ♀ mounted with a ♂ *Gastrancistrus* on a pith block (FI), similarly labelled; 1 ♂ (FI), labelled "Galicia Bestwin 1874 Wachtl; 49; *Torymus*

*saliciperdae* Ruschka type"; 2 ♂♂ (FI), similarly labelled; 1 ♂ and 1 ♀ (FI), mounted on a pith block and labelled "49; *Torymus saliciperdae* Ruschka Type".

*Callimome henrikseni* Hoffmeyer: **lectotype**, here designated ♀, (ZMK): labelled (1) a tiny green label; (2) "Mus" (3) "Type" (pink label); (4) "*henrikseni* Hoffmeyer Type". **Paralectotypes**: here designated, 3 ♀♀ (ZMK), with similar labels but (1) to (3) only.

Comments.— *Callimome microcerus* Walker. (The following are notes made by M. W. R. de Vere Graham) "Taken near Clermont (France, Puy de Dôme) by Walker in 1830. It is said to be represented in the British Museum collection (Walker, 1848: 102; not 1846, as stated by Eady (1959: 269)) but Eady could not find the material. The colour characters mentioned by Walker, particularly of the antennae, are not found in combination in males of any other known European species, while the rest of the description applies very well to that sex of the present species, so that we have no doubt of its identity. On 18.vii.1977 I swept three females from a bush of *Salix purpurea*, on the plateau of Gergovie, near Clermont" We designate as neotype of *Callimome microcerus* Walker, 1833, one of these females and have so labelled it (BMNH). ICZN (Art. 75(d)(4)) states that a neotype "may be based on a different sex ..... if necessary or desirable".

*Callimome Aerope* Walker: we consider *aerope* Walker, 1844 to be a synonym of *microcerus* (Walker) from the description, which is quite good. (see also under *pulchellus* Thomson).

*Callimome insolitus* Walker: the ovipositor of the lectotype is broken off.

*Torymus saliciperdae* Ruschka: there is another pith block bearing 1 ♂ and 1 ♀ in FI, labelled "Prater, Wachtl" which are probably not syntypes (labelled as "not syntypes").

Biology.— Reared from galls of *Helicomyia saliciperda* (Dufour) (Dipt., Cecidomyiidae) on *Salix purpurea* and *Salix amygdalina*.

Distribution.— Austria, Czech Republic, Denmark, France, Great Britain, Ireland, Netherlands, Russia: East Siberia (Amurland), Sweden. It appears to be one of the commonest *Torymus* species on *Salix* and evidently very widely distributed.

*Torymus microstigma* (Walker, 1833)  
(fig. 150)

*Callimome brevicauda* Walker, 1833: 126, ♀.

*Callimome microstigma* Walker, 1833: 127, ♀.

*Torymus microstigma*; Eady, 1959: 264; Sellenschlo & Wall, 1984: 26; Grissell, 1995: 284.

*Torymus viridis* Foerster, 1840: xxx, ♂ ♀; Mayr, 1874: 123-124.

?*Callimome strenuus* Walker, 1871: 34, ♀; Grissell, 1995: 288.

*Torymus pruni* Cameron, 1883: 196, ♀ ♂.

Type material.— *Callimome brevicauda* Walker and *C. microstigma* Walker: **lectotypes**: designated by Eady (1959: 264), now standing as Types Hym. 5. 1576 and 5.1585 respectively (BMNH).

*Torymus viridis* Foerster: **lectotype**, ♀, (NHMW): here designated. It is pinned on a very thick long pin, and stands under this name in NHMW; the head of the pin is covered with red sealing-wax. Labels are: "Or. Ex. 4/9.38", "Collect. G. Mayr", "*Tor. viridis* Förster, Type", "Aachen [printed]".

*Callimome strenuus* Walker: no type designated.

*Torymus pruni* Cameron: original material not located.



Comments.— *Torymus viridis* Foerster: the body of the lectotype is bright green and the legs extensively pale, thus differing from average British females of *microstigma* (Walker, 1833), with which it was synonymised by Eady (1959: 264). Specimens reared from *Wachtliella rosarum* (Dipt. Cecidomyiidae) tend to resemble the lectotype of *viridis*, whilst those reared from *Diplolepis* spp. (Hym. Cynipidae) resemble *microstigma*, though there is much variation in colour of body and legs, and some in the relative length of the ovipositor sheaths. It seems best to regard the two forms as belonging to one species.

*Callimome strenuus* Walker: described from a female or females from "England. In Dr. Chapman's collection" (Walker, 1871: 34). Eady (1959: 269) could not find the original material. Walker compared *strenuus* with *macropterus* (Walker) [= *rubi* Schrank]. The description of the female accords rather well with some specimens of *microstigma* having pale legs and a rather long ovipositor (as in the form *viridis* Foerster).

*Torymus pruni* Cameron: the original material was reared from galls of "*Cecidomyia pruni*" Kalt. found in Muysdock Wood, near Milngavie (Scotland: Glasgow area). The description fits average British *microstigma* quite well; *pruni* was synonymised with *microstigma* by Eady (1959: 264).

Biology.— Reared from galls of *Putoniella marsupialis* Löw on *Prunus spinosa* and from galls of *Wachtliella rosarum* (Hardy) on *Rosa*.

Distribution.— Germany, Great Britain, Netherlands.

#### *Torymus micrurus* Boucek, 1994

*Torymus micrurus* Boucek, 1994:79-80, ♀; Grissell, 1995: 284.

Type material.— **Holotype**, ♀, (BMNH): Germany, Aken an der Elbe, 9.vi.1940 (H. Köller). **Paratypes**: (BMNH, ZMHU): 1 ♀ topotypic; 1 ♀ France, Vaucluse, Mont Ventoux, 22.vii.1978 (Graham).

Male.— Unknown.

Biology.— Unknown.

Distribution.— France, Germany.

#### *Torymus millefolii* Ruschka, 1921 (figs 151-152)

*Torymus millefolii* Ruschka, 1921:339, ♂ ♀; Seilenschlo & Wall 1984: 26; Grissell, 1995: 284.  
*Callimome millefolii*; Hoffmeyer, 1930c:240; 250.

Type material.— **Lectotype**, ♀, (NHMW): here designated, mounted on a minutien pin on a pitch block with a male, labelled: "e *Hormomyia millefolii* Znaim Coll. Wachtl"; "*T. millefolii* Ruschka, Type"; "Type" (red label). **Paralectotypes**: (here designated), the male aside to the lectotype; also two other females, labelled "*Rhopalomyia millefolii*"; "Jicin Böhmen Baudys"; *millefolii* Ruschka det. Ruschka", "Type" (red label)" Further syntypes (here designated paralectotypes) from Forstinstitut, now in NHMW, Vienna, as follows: (1) A block with three females and five males, labelled Moravia Znaim 14.9.83 Wachtl; 25; *Torymus millefolii* Ruschka Type; a blue label. (2) A block with three females (one damaged) 4 males, labelled Moravia Znaim 26.11.83; 23; *Torymus millefolii* Ruschka Type; three other females from this batch have been remounted by Dr. Boucek.

Biology.— Reared from galls of *Rhopalomyia millefolii* (Loew).

Distribution.— Austria, Czech Republic.

*Torymus monticola* spec. nov.  
(fig. 153)

Type material.— **Holotype**, ♀, (BMNH): France-Lozère "Aigoual Prat Peirot 5.7.1977, M. de V. Graham". **Paratypes**, 5 ♂♂, 7 ♀♀, (BMNH, MJG): same data as holotype (one female without head).

Description of female.— Morphology: head in dorsal view 1.9-2.0 times as broad as long; temples 0.21 length of eyes, converging fairly strongly, curved. POL 1.87-1.9 00L, 00L 1.25-1.3 OD. Vertex finely reticulate, with scattered very small punctures. Frontally seen the head is trapeziform, with straight genae. Mouth 1.9 length of malar space which is 0.37-0.38 length of eye. Clypeus very slightly produced, curved. Face fairly thickly set with thin setae. Antennal toruli somewhat above lower eyeline their lower edge about 0.8 times nearer to clypeus than the upper edge of the toruli to lower edge of anterior ocellus; length of pedicellus plus flagellum 1.2 times breadth of head, flagellum (fig. 153) proximally hardly or just as stout as pedicellus, fairly strongly clavate; pedicellus 1.5 times as long as broad; anellus distinctly broader than long; funicle segments quadrate, only F7 very slightly transverse; sensilla sparse, uniseriate.

Mesosoma 1.95 times longer than broad, moderately strongly arched. Mesonotum 1.25 times as broad as long, finely reticulate and very slightly rippled in front, slightly shiny; piliferous punctures numerous, minute; notauli not deep; setae of normal length, slightly raised. Scutellum 1.16 times as long as broad, reticulation like that of mesoscutum, its base narrowly rounded, setae on hind third longer and more raised than those on frontal part; flange extremely narrow, minutely trabeculate. Dorsellum weakly reticulate with a trace of a sulcus. Propodeum shiny with very fine delicate alutaceous sculpture and with a row of small fovea along base. Mesepimeron 1.6 times as long as broad, about 0.7 times as long as mid coxa. Hind coxa 2.3 times as long as broad, its hind edge moderately curved, pilose in its basal half dorsally, mainly with rather coarse slightly raised reticulation. Spur of hind tibia 0.4 times length of basitarsus and equal to or slightly greater than tibial breadth. Forewing 2.2 times as long as broad, costal cell 10 times as long as broad, with one row of setae on upper surface and on lower surface with one row plus more scattered setae except just in the middle; basal cell with scattered setae on upper third or half, closed below; basal vein with 4-5 setae; speculum rather small, not extending beyond parastigma, with scattered setae on lower surface in upper half or more, partly open below; M:PM:ST=47:10:4.5; stigma shortly petiolate, small.

Gaster hardly compressed; basal sternite not reaching beyond hind coxae; hypopygium extending about three-quarters length of gaster, bare except some hairs at tip. Ovipositor as long as metasoma plus one-third of mesosoma, index 1.73-1.95. Length 1.4-2.0 mm.

Colour: head and mesosoma dark blue-green; sides of mesosoma somewhat bronze. Metasoma bluish, sometimes partly bronze laterally. Scape blue-black, at most radicle obscurely testaceous. Palpi brown. Coxae, mid femora except their tips very narrowly, as mesosoma.; trochanters mainly fuscous; tibiae fuscous to black, at

most bases and tips narrowly testaceous. Fore tarsi fuscous, mid and hind basitarsus whitish-testaceous, segments 2-5 darkening gradually to fifth which is fuscous. In largest females the fore femora and tibiae are testaceous. Tegulae obscurely testaceous anteriorly, fuscous posteriorly. Wings very slightly grey-tinged, venation brownish.

Male.— Differs from female as follows: scape 4.1 times as long as broad, extremely minutely granulate, slightly shiny. Length pedicellus plus flagellum 1.27 times breadth of head; pedicellus slightly broader; funicle proximally distinctly stouter than pedicellus, cylindrical; anellus slightly more transverse. F1 somewhat stouter than pedicellus, quadrate or slightly transverse, tending to be slightly stouter than F2, following segments subequal in length, subquadrate to slightly transverse; clava 2.1 times as long as broad, slightly more pointed; flagellum thickly clothed with short, strongly curved black setae. Hind femur four times as long as broad. Metasoma sub-linear, slightly shorter and much narrower than mesosoma.

Comments.— The female of *monticola* much resembles that of *genisticola* Ruschka, which differs in having the antennal flagellum (fig. ) proximally somewhat stouter than pedicellus and thickening only slightly distad. POL 2.0-2.1 00L, ocelli slightly smaller. Malar space only about 0.29-0.3 length of eye. Scape testaceous beneath. Tegulae mainly or wholly yellowish.

Some dwarf females of *juniperi* may be mistaken for *monticola* but they differ in having toruli somewhat higher (distance between upper edge of toruli and lower margin of ocellus about 1.15 distance between lower edge of toruli and anterior margin of clypeus); longer apical spur of hind tibia slightly shorter than breadth of tibia; the flagellum is usually rather thicker, the wings slightly infuscate. Dwarf males of *juniperi* differ from males *monticola* in having the hind femora stouter (about 5 times as long as broad) and the spur of the hind tibia is slightly shorter.

Biology.— Unknown.

Distribution.— France.

*Torymus narvikensis* Graham, 1994  
(fig. 154)

*Torymus narvikensis* Graham, 1994a: 26-27, ♂ ♀; Grissell, 1995: 284.

Type material.— **Holotype**, ♀, (BMNH): original designation. Norway, Narvik (Novitzky), reared early May 1971. **Paratypes**: 1 ♂, 1 ♀ (BMNH): same data as holotype.

Biology.— Reared from galls of *Rabdophaga rosaria* (Loew).

Distribution.— Netherlands, Norway.

*Torymus nemorum* Boucek, 1994  
(fig. 155)

*Torymus nemorum* Boucek, 1994: 81-82, ♀; Grissell, 1995: 284.

Type material.— **Holotype**, ♀, (NMP): Czech Republic, Moravia: Lednice, 17.vii.1962 (Strejcek). **Paratype**: ♀, (BMNH): Bohemia: Trabice Hill nr. Ústí nad Labem, 28.vi.1957 (Boucek).

Biology.— Unknown.

Distribution.— Czech Republic.

*Torymus nigratarsus* (Walker, 1833)  
(fig. 259)

? *Cinips viridis* Fonscolombe, 1832: 284; Graham, 1992b: 1098.

*Callimome nigratarsus* Walker, 1833: 135, ♂ ♀.

*Torymus nigratarsus*; Boucek & Graham, 1978a: 227; Grissell, 1995: 284.

*Torymus alpinus* Thomson, 1876: 85, ♀; Sellenschlo & Wall, 1984: 21.

*Torymus taxi* Ruschka, 1921: 388, ♀; Nikolskaya & Zerova, 1978: 371; Sellenschlo & Wall, 1984: 28.

*Callimome taxi*; Hoffmeyer, 1930c: 239.

[*Torymus juniperi* (L.) Graham, 1969: 65, in part. Misidentification].

Type material. *Cinips viridis* Fonscolombe: original material lost (Graham, 1992b).

*Callimome nigratarsus* Walker: **lectotype**, ♀, (BMNH): designated by Eady (1959: 261).

*Torymus alpinus* Thomson: **lectotype**, ♀, selected by Graham, validated by Hansson (1991: 10).

*Torymus taxi* Ruschka: **holotype**, ♀, (FI): here designated, labelled: "Austr. inf. Göttweig Wachtl; 30.8.901" [sic]; a label with a horizontal bar, the upper part blanc, in the lower part "31"; "*Torymus taxi* Ruschka Type".

Comments.— *Cynips viridis* Fonscolombe: Graham (1992) discussed a possibility that this might have been the male sex of *nigratarsus* but without reaching a definite conclusion.

*Torymus alpinus* Thomson and *T. taxi* Ruschka are synonymised with *nigratarsus* (Walker) by Boucek & Graham (1978: 227).

Biology.— Parasite of *Taxomyia taxi* Inchb. (Dipt. Cecidomyiidae) on *Taxus baccata*.

Distribution.— Austria, France, Great Britain, Netherlands, Sweden.

*Torymus nitidulus* (Walker, 1833)  
(figs 156-158)

? *Torymus contractus* Dalman, 1820:178, ♂.

*Callimome nitidulus* Walker, 1833: 138, ♀.

*Torymus nitidulus*; Grissell, 1995: 285.

*Torymus pallidicornis* Boheman, 1834: 363, ♀; Schmiedeknecht, 1914: 208.

*Liopterphus pallidicornis*; Thomson, 1876: 99; Nikol'skaya & Zerova, 1978: 368; Sellenschlo & Wall, 1984: 29.

*Callimome nanulus* Walker, 1874a: 313, ♀; Grissell, 1995: 284, **syn. nov.**

Type material.— *Callimome nitidulus* Walker: **lectotype**, ♀, (BMNH, type Hym. 5.1610): designated by Eady (1959: 260).

*Torymus pallidicornis* Boheman: **lectotype**, ♀, (NR): here designated. Two females which are conspecific, stand under this name. Both are labelled (1) Sm [Småland] (2) Bhn [Boheman] (3) Type (4)Thoms [Thomson].

*Callimome nanulus* Walker: **lectotype**, ♀, (BMNH, type Hym. 5.32): here designated, labelled: "Amurland" "*Callimome nanulus*" [in Walker's hand].

Comments.— *Torymus contractus* Dalman: no type material found. The short description of the male within the genus *Torymus*: "antennarum scapo flavo" can hardly be anything but *T. nitidulus*.

Biology.— Reared from birch catkins with *Semudobia* spp. (Dipt. Cecidomyiidae).  
Distribution.— Holarctic; possibly over whole zone of *Betula* spp. from northern U.S.A., Europe, Asia to Mongolia and China.

*Torymus nobilis* Boheman, 1834  
(fig. 260)

*Torymus nobilis* Boheman, 1834: 339-340, ♂ ♀; Mayr, 1874: 92-93, in part; Thomson, 1876: 92; Boucek, 1977: 26; Nikol'skaya & Zerova, 1978: 370; Sellenschlo & Wall, 1984: 27 in part; Graham, 1994a: 33; Grissell, 1995: 285.

*Torymus conjunctus* Nees, 1834: 63-64, ♀.

*Torymus nitidulus* Nees, 1834: 63-64, ♂ [not ♀].

*Callimome subterraneus* Curtis, 1835: folio 552, ♀.

Type material.— **Lectotype** of *Torymus nobilis* Boheman, ♀ (NR) and **paralectotypes** 2 ♂♂ (NR), all designated by Graham (1994: 53).

*Torymus conjunctus* Nees, and *T. nitidulus* Nees: original material destroyed.

*Callimome subterraneus* Curtis: no lectotype has been selected.

Comments.— *Torymus nobilis* Boheman: of the two male and four female syntypes only one female and the males have the correct locality label. Some notes on structural characters were given by Graham (1994:33).

*Torymus conjunctus* Nees and *T. nitidulus* Nees: the details given by Nees regarding length of ovipositor and colour of hind legs show that he must have had *nobilis*. Nees described the supposed male of his *nitidulus* as having the hind tibiae fuscous medially, which is a character of male *nobilis* and not of *roboris* (Walker)(= *nitidulus* (Nees)).

*Callimome subterraneus* Curtis: six specimens stand under this name in the Curtis collection (MVMA); they have not been examined by the present authors. *C. subterraneus* was placed in synonymy by Walker (1846: 15). Curtis' beautiful figure, in which he shows the hind tibiae as infuscate, clearly points to *nobilis*.

Biology.— Reared from galls on roots of *Quercus* spp: *Andricus quercusradicis*, *Biorhiza pallida* etc.

Distribution.— Croatia, Czech Republic, Denmark, France, Germany, Great Britain, Ireland, Spain, Sweden.

*Torymus notatus* (Walker, 1833)  
(figs 159-165)

*Callimome notatus* Walker, 1833: 134, ♀.

*Syntomaspis notata*; Steffan, 1962: 188; Sellenschlo & Wall 1984: 21.

*Torymus notatus*; Grissell, 1995: 285.

*Syntomaspis incrassata* Thomson, 1876: 75, ♂ ♀.

Type material.— *Callimome notatus* Walker: **lectotype**, ♀, (BMNH): designated by Eady (1959: 260). *Syntomaspis incrassata* Thomson: **lectotype**, ♀, (ZIL): Sweden, Skåne, Ringsjön, labelled "Rsiö", selected by Graham, validated by Hansson (1991: 10).

Comments.— In females of the nominotypical form from Northern Europe the

postmarginal vein is distinctly thickened and tapers rather less. Some females reared in the south of France, from either *Plagiotrochus ilicis* or *Dryocosmus australis* on *Quercus ilex*, have the vein thinner and tapering rather more distinctly. No other differences appear to be present and possibly the character noted is a variation associated with different hosts and/or geographical location. This form, reared from *D. australis* on *Q. ilex*, was regarded as *notatus* by Steffan (1962). There is a series (BHNH) France, Pyrénées-Orientales, nr. Asles-sur-Tech, reared from galls on *Quercus* × *auzandii*, 23.v.1961 (D. & J. Clark). Three males in coll. MJG, swept from *Euphorbia* in March in Spain have a thickened postmarginal vein as well. An explanation cannot be given.

Biology.— Reared from cynipid galls on *Quercus*.

Distribution.— Czech Republic, France, Great Britain, Greece, Netherlands, Spain, Sweden.

*Torymus novitzkyi* Graham, 1994

*Torymus novitzkyi* Graham, 1994a: 28, ♂ ♀; Grissell, 1995: 285.

Type material.— **Holotype**, ♀, (BMNH): Sweden: Norrbotten, Abisko, reared 30.x.1970 from leaf galls on *Salix* ? *caprea*. **Paratypes**: (BMNH): same locality and host plant, 3 ♂♂, 3 ♀♀, reared 20.x.1970, 4 ♂♂, 4 ♀♀, 24.x.1970, 4 ♀♀, 26.x.1970, 3 ♀♀, 30.x.1970, 2 ♂♂, 2 ♀♀, 2.xi.1970.

Biology.— Reared from leaf galls on *Salix* ? *caprea*.

Distribution.— Sweden.

*Torymus orobi* Mayr 1874, **stat. rev.**  
(fig. 166)

*Torymus galii* Boheman var *Orobi* Mayr, 1874: 122-123, ♂ ♀.

Type material.— **Lectotype**, ♀, (NHMW): here designated, the uppermost of two females on the same pith block, in good condition (the most lower female lacks gaster). Labels: "Priesting Tschek; *T. galii* var. *orobi* det. G. Mayr; Crrub der Gallen [words indecipherable] *Orobus pannonicus* [in pencil]; Galii Boh. var. *orobi* m". **Paralectotypes**: 2 ♂♂, 7 ♀♀ (NHMW), the remaining specimens, here designated. One ♀ (NHMW), is here designated paralectotype as well; it bears only labels in Dr. Boucek's hand reading "Priesting bei Wien. Galle *Orobus pannonicus*. Tschek; ♀ ST [syntype] *Torymus galii* var. *orobi* Mayr det. Z. Boucek 1978". Graham's paralectotype label has been added.

Comments.— Mayr stated that Tschek had reared 24 specimens. Two males and 8 females now stand under this name in NHMW. Two other females were formally in Forstinstitut, Vienna. The first specimen agrees with the description and is the above cited paralectotype; the second specimen belongs to *socius* Mayr and disagrees with the description particularly in its short ovipositor; it is rejected as a syntype of *orobi*.

Biology.— Reared from galls of *Orobus pannonicus* on *Lathyrus*.

Distribution.— Austria, France.

*Torymus paludum* spec. nov.  
(fig. 167)

Type material.— **Holotype**, ♀, (BMNH): England, Berkshire "Wytham Mead (1) Phalaris 15/7/61, M.

de V. Graham". **Paratypes:** 1 ♀ (BMNH), topotypic but 12/7/64; 1 ♀ (BMNH), Scotland, "MP [Mid Perth], Killin (2) pond and marsh 15/7/54, M. de V. Graham"; 1 ♀ (BMNH), Ireland, Co. Antrim, "Lough Neagh at Selshan, (1) 26/6/57, M. de V. Graham".

Description of female.— Morphology: head in dorsal view (fig. 167) 2.1 times as broad as long, temples 0.17 apparent length of eyes, rather strongly converging, slightly curved. POL 2.05 OOL, OOL 1.15 OD. Vertex finely reticulate with several small punctures in ocellar triangle and between lateral ocelli and eyes. In frontal view the genae are nearly straight. Mouth is 2.0-2.2 times malar space which is 0.35 length of eye. Clypeus is evenly curved forwards. Antennae with toruli distinctly above lower eyeline but but slightly nearer to clypeus than to anterior ocellus; scape 4.1 times as long as broad, reaching to top of anterior ocellus; pedicellus plus flagellum 1.35 breadth of head; anellus quadrate or nearly so; pedicellus 1.8-2.0 times as long as broad, as long as or slightly longer than F1; F1 in one female 1.2 times as long as broad, other segments quadrate, but usually F1-F6 are quadrate, or F6 and F7 slightly transverse; clava 2.33 times as long as broad; sensilla numerous, uniseriate.

Mesosoma 1.85 times as long as broad. Mesonotum 1.25 times as broad as long with few and small punctures, sculpture in frontal half transversely alutaceous, in posterior half scaly. Scutellum 1.2 times as long as broad, reticulation as on posterior part of mesonotum in posterior part more finely; piliferous punctures sparse but larger than those on mesoscutum; flange narrow with numerous trabeculae. Dorsellum nearly smooth. Propodeum with delicate superficial alutaceous sculpture, smoother medially, with a row of small fovea along base. Mesepimeron 0.6-0.65 length of mid coxa, about 1.35 times as long as broad. Hind coxa 2.15 times as long as broad, with rather coarse slightly raised reticulation, hind edge strongly curved, pilose in basal half; hind femur 4.1 times as long as broad; spur of hind tibia 0.42 length of basitarsus. Forewing 2.43 times as long as broad; costal cell nearly ten times as long as broad, bare above except a row of setae in distal third, below with one complete row plus scattered setae in basal third and distal two-fifth; M:PM:ST=44:10.3:4.7, stigma subsessile or shortly petiolate; basal cell with a row of setae below SM, nearly closed below; basal vein with 3-6 setae; speculum extending slightly beyond tip of parastigma, open below.

Gaster hardly compressed, basal sternite slightly longer than coxa; hypopygium extending about 0.7 along gaster, bare except at tip. Ovipositor index 2.0-2.7, about as long as metasoma plus half mesosoma. Length 3.0-3.4 mm.

Colour: body bright green to blue-green. Antennae black, scape yellowish beneath. Coxae coloured like body, fore coxae yellowish apically; legs otherwise yellowish-testaceous, femora more reddish except at tips; in the Scottish and Irish females the hind femora are broadly black medially while the fore and mid femora are slightly infuscate proximally.

Male.— Unknown.

Comments.— From the species of the *chloromerus* group having the ovipositor less than 2.5 hind tibia, *paludum* differs in having the antennal scape reaching at least the level of the top of the anterior ocellus; the anellus is virtually quadrate and the legs are extensively pale.

Biology.— Unknown.

Distribution.— Great Britain, Ireland.

*Torymus partitus* spec. nov.  
(figs 168-169)

Type material.— **Holotype**, ♀, (RMNH): Netherlands "Ankeveen (Googh) 17.iv.1986 G. Gijswijt, /galls *Rhabdophaga salicis*". **Paratypes**: Netherlands: 1 ♀ (MJG), topotypic; 4 ♀♀ (ZMA), "Langbroek 29.ii.1968 W. Nijveldt, uit depot 148 *Rhabd. salicis* verz. 24.i.1968 op *Salix ?caprea*"; 1 ♀ (MJG), same data date of emergence 27.ii.1968; 2 ♀♀ (MJG), Netherlands "Ankeveen 26.iv.1981 M.J. Gijswijt /gal in *Salix* tak coll. xii.1980"; 1 ♀ (MJG), "Ankeveen, Bergse Pad, M.J. Gijswijt. /*Rhabdophaga ?salicis*, 2.ii.1997"; 1 ♀ (MJG), Italy "Italia - Mar., prov. Macerata, M.J. Gijswijt" "SARNANO 850 m 23.v.1993"; 1 ♀ (RRA), France "Ex *Rhabdophaga* gall on *Salix*. La Force, Dordogne, France. coll. 5.1985. R.R. Askew", (A male mounted with it belongs to a different species, having hind coxa bare dorsally); 1 ♂ (RRA) same data.

Description of female.— Morphology: head in dorsal view (fig. 168) 2.1 times as broad as long, temples 0.18 times apparent length of eyes, converging very strongly, curved. POL twice OOL, OOL as long as OD. Vertex finely reticulated, with a number of minute, inconspicuous punctures. In frontal view the head is trapeziform, with straight genae. The mouth is 1.8-2.1 malar space, the latter 0.33-0.36 length of eye. Clypeus hardly produced, very slightly curved. Antennae toruli well above lower eyeline; scape 4.1 times as long as broad, just reaching lower edge of anterior ocellus; pedicellus plus flagellum 1.2-1.3 times as long as breadth of head, flagellum proximally hardly stouter than pedicellus, weakly clavate; pedicellus 1.6-1.75 times as long as broad; anellus 1.3 times as broad as long; F1 1.3-1.6 times as long as broad, as long as or slightly shorter than pedicellus, F2 and F3 slightly elongate, F4 hardly so, rest quadrate; clava twice as long as broad; sensilla numerous, uniseriate. Face thickly clothed with short silvery setae.

Mesosoma 1.9 times as long as broad. Mesoscutum 1.2 times as broad as long, finely reticulate (more rippled anteriorly), punctures numerous but very small and widely separated; setae rather short, only slightly raised (fig 169). Scutellum 1.33 times as long as broad, round to subtruncate at base, sculpture as on mesoscutum, punctures as on mesoscutum but with a bare strip down middle, setae on posterior half longer and more raised; flange very narrow, with fine trabeculae. Dorsellum nearly smooth. Propodeum finely delicately alutaceous, smoother medially, with a row of small fovea along base. Mesepimeron 1.6 times as high as broad, distinctly shorter than mid coxa (20:25). Hind leg with coxa 2.6 times as long as broad, externally with rather coarse, slightly raised reticulation, pilose in basal half dorsally; femur 4.2-4.4 times as long as broad, spur of tibia 0.33-0.34 times as long as basitarsus. Forewing 2.6 times as long as broad, costal cell about ten times as long as broad, above with 1 row of setae, which is broken medially, below with one complete row plus some scattered setae; basal cell with 1-2 setae, partly closed; basal vein with three to five setae; speculum moderately large, with a few scattered setae, mainly open; M:PM:ST=20:20:9, ST sessile to subsessile, stigma very small.

Gaster moderately convex compressed, basal sternite projecting beyond coxa by nearly half its length; hypopygium extending three-quarters along gaster, bare except tip. Ovipositor index 2.85-3.3, as long as metasoma plus mesosoma. Length 2.5-3.4 mm.

Colour: bright green, pleuron lightly golden; also gaster posteriorly and laterally golden. Palpi yellow. Antennae black, scape fuscous above and distally. Base of fore



coxa, two-third of mid coxa and whole of hind coxa as body (sometimes fore coxa wholly yellow), hind femora slightly infuscate medially in two paratypes, rest yellow, with claws brown, fifth tarsal segment slightly brownish. Tegulae yellow. Wings hyaline, venation yellowish.

Male.— Like female, with darker legs: fore femora slightly darkened, other femora brown except tips, hind tibiae infuscate.

Comments.— The females of this species somewhat resemble those of *T. fuscipes* Boh., which has a shorter tibial spur, darker legs and a more coppery colour.

Biology.— Reared from galls of *Rabdophaga salicis* (Schrank) (Dipt. Cecidomyiidae) on *Salix caprea*.

Distribution.— France, Italy, Netherlands.

#### *Torymus pascuorum* Boucek, 1994

*Torymus pascuorum* Boucek, 1994: 82-83, ♂ ♀; Grissell, 1995: 285.

Type material.— **Holotype**, ♀, (BMNH): England, Buckinghamshire: Burnham Beeches, 25.vi-vii.1974 (Boucek). **Paratypes**: 100 ♀ ♀, 30 ♂ ♂ (BMNH, NMP, MJG, NHMW, OUM, ZMNU, ZSM, same locality as holotype but 7.viii and 4.ix.1974 and 17.vi., 7-17.viii., 7-14.ix. and 17.x.1975; Surrey: Thames Ditton; 1 ♀, 1.viii.1974; Kent: Dungeness, 19.ix.1971 (all Boucek). Germany, Upper Bavaria: Sielenbach, 2 ♀ ♀ 28.vi and 1.vii.1967 (Bachmaier in ZSM).

Biology.— Associated with *Cytisus scoparius*; in Bavaria reared from galled winter buds of this plant.

Distribution.— Great Britain, Germany, Spain.

#### *Torymus pastinacae* spec. nov.

Type material.— **Holotype**, ♀, (RMNH): Yugoslavia "Joegoslavie, Slovenie, Rudovljica, 1-13.ix.1972; gal Kieff. pimp. op *Pastinaca* verz. 6.viii.1972 H.J. Vlug". **Paratypes**: (ZMA, MJG), 6 ♀ ♀, 6 ♂ ♂ same data as holotype; 2 ♀ ♀, 1 ♂ same data as holotype, but date of emergence 3.viii.1972; 6 ♂ ♂ same data as holotype, but date of emergence 25-28.viii.1972; 3 ♀ ♀, 2 ♂ ♂ Germany, "uit depot met *Kiefferia pim-pinellae* coll. als larven op Umbelliferen w.o. *Peucedanum* te Bärnstein (Dtsl.) augustus 1965"

Description of female.— Morphology: head in dorsal view about twice as broad as long, temples 0.25-0.32 apparent length of eyes, strongly converging and curved. POL 2.25 OOL, OOL 1.15 OD. Vertex finely reticulate, with several, rather indistinct punctures. In frontal view the eyes are separated by slightly less their length. Mouth 2.05-2.2 malar space, the latter 0.35 length of eye. Genae straight. Clypeus slightly curved forwards. Antennae with toruli well above lower eyeline, but slightly nearer to clypeus than to anterior ocellus; scape 4.5 times as long as broad, barely reaching anterior ocellus; pedicellus plus flagellum 1.2-1.28 times as long as breadth of head, flagellum proximally stouter than pedicellus, rather weakly clavate; pedicellus 1.5 times as long as broad; anellus moderately transverse; F1 1.25 times as long as broad, F2-F6 subquadrate, F7 slightly transverse; clava 1.8 times as long as broad; sensilla numerous, uniseriate.

Mesosoma 1.75-1.8 times as long as broad. Mesoscutum 1.4 times as broad as long, with fine reticulation (more rippled-scaly in front); punctures numerous and

minute, separated by about twice their diameter; setae rather short, only slightly raised. Scutellum 1.23 times as long as broad, sculptured as mesoscutum; setae on posterior third long and distinctly raised, punctures a little larger than on mesoscutum; flange very narrow, moderately trabeculate. Dorsellum nearly smooth, with a trace of a median sulcus. Propodeum shiny, delicately alutaceous, smoother medially, with a row of very small fovea. Mesepimeron 1.4 times as long as broad, distinctly shorter than mid coxa. Hind leg with coxa 2.4 times as long as broad, sparsely pilose; femur 4.3 times as long as broad, longer spur of tibia 0.46 length of basitarsus. Forewing 2.55 times as long as broad; costal cell about 10 times as long as broad, above with a row of setae in distal third or half plus a few at base, below with one row of setae plus scattered setae at base and distal third; M:PM:ST=71:15:6, stigma very small, petiolate, not at acute angle with PM; basal cell with a few setae below SM, partly closed (distally) or wholly; basal vein with 3-5 setae; speculum moderately large, extending somewhat beyond parastigma, partly open.

Gaster slightly compressed; basal sternite projecting slightly beyond coxa; hypopygium reaching three quarters along gaster, bare except tip. Ovipositor index 1.9-2.1, sheaths about as long as metasoma plus one third mesosoma. Length 2.4-2.6 mm.

Colour: as *curtisi*, but legs tending to be paler: hind tibiae less strongly darkened, usually more or less infuscate but not black, occasionally yellow; fore and mid femora yellow, or darkened beneath, occasionally infuscate in basal two-fifth; fore coxa sometimes partly yellow.

Male.— Differs from female as follows:

Morphology: eyes distinctly hairy; scape 2.7 times as long as broad, pedicellus plus flagellum 1.4 times breadth of head, segments quadrate to slightly transverse, only F1 longer than broad and narrower than pedicellus and F2.

Colour: scape dark green, legs with all coxae and hind femora green, other parts of legs dark brown except tarsal segments 1-3, which are testaceous.

Comments.— This species is morphologically close to females of *epilobii* spec. nov. and differs only on average in small details (see key to females, couplet 145) and its host. Differs from *ovius* and *curtisi* in larger and less clavate flagellum; from *socius* also in its longer ovipositor and from *curtisi* also in its broader mouth and rather shorter malar space.

Biology.— Reared from *Kiefferia pimpinellae* (Löw) (Dipt. Cecidomyiidae) on *Pastinaca* and on *Peucedanum*.

Distribution.— Germany, Yugoslavia.

*Torymus persicariae* Mayr, 1874.  
(fig. 170)

*Torymus persicariae* Mayr, 1874: 59, ♂ ♀; Sellenschlo & Wall, 1984: 27.

*Callimome persicariae*; Hoffmeyer, 1930c: 241.

*Callimome polygona* [sic; misnomer]; Hoffmeyer, 1930c: 251-252, ♂ ♀.

*Torymus polygona*; Grissell, 1995: 286.

Type material.— **Lectotype**, ♀, (NHMW): here designated. It is on a minutien pin, stayed on a pith block together with a male. Labelled: "Collect. G. Mayr", "9/9.69 aus Gallen der *Cecidomyia persicariae* auf *Polygon. amphibium*. Zwickau ... [undecipherable] v. S". [von Schlectendal].

Comments.— Mayr stated that he had two females, and mentioned only a single male, lacking gaster; the male in NHMW possesses its gaster and so is not a syntype. Hoffmeyer (1930c: 251) referred to this species as “*polygoni*” Mayr by lapsus.

Biology.— Parasite of *Wachtliella persicariae* (Linnaeus) on *Polygonum amphibium*.

Distribution.— Austria, Germany, Great Britain, Netherlands.

*Torymus phillyreae* Ruschka, 1921  
(figs 171-173)

?*Torymus sarothamni* Kieffer, 1899a: 369, ♀; Grissell, 1995: 287.

*Torymus phillyreae* Ruschka, 1921: 340-341, ♂ ♀; Sellenschlo & Wall, 1984: 27; Graham, 1994b: 120-122; Grissell, 1995: 285.

?*Torymus* nr. *phillyreae*; Parker, 1924: 280-281, 302-304, pls. 2, 6, 9, 11, 26-28, 30-32.

*Callimome schiödtei* Hoffmeyer, 1930b: 115, ♀; 1930c: 243; Graham, 1994b: 121.

*Callimome scoparii* Hoffmeyer, 1930b: 116, ♀; Grissell, 1995: 287. **Syn. nov.**

*Torymus tripudians* Graham, 1993: 19-21, ♂ ♀; 1994b.

Type material.— *Torymus sarothamni* Kieffer: The original material (number not stated), reared in NE France, at Bitsche, is apparently lost.

*T. phillyreae* Ruschka: **lectotype**, ♀, (NHMW): here designated, mounted on a minutien pin, stayed with a male on one block, labelled (1) “e *Diplosis phillyr.* Miramare ex coll. Wachtl” (2) “*Torymus phillyreae* Ruschka, Type” (3) red label “Type” (4) NHMW acces. label “no. 321”. **Paralectotypes**: 2 ♀ ♀, 3 ♂ ♂ (NHMW), here designated, the male mounted with the lectotype, a male and a female mounted on one block labelled “Miramare Istria; 3; *Torymus phillyreae* Ruschka Type” and a blue label, (2) one male and one female on a block with same labels as (1) except for “1” instead of “3”, one female (remounted, on card, by Boucek), labelled in Boucek’s hand: “Miramare bei Triest ex *Braueriella phillyreae* Wachtl.; ♀ *Torymus phillyreae* Rusch. det. Z. Boucek, 1978.”

The morphology of immature stages described and figured by Parker (1924) may have belonged to this species.

*Callimome schiödtei* Hoffmeyer: **holotype**, ♀, (ZMK): mounted on a card-point; labels “Roma Schiödte; *Callimome schiödtei* Hoffmeyer Type”. A paratype ♀ (MCSN) on a card labelled “Sardegna Enas 26.v.1908. A Doderò; *Callimome schiödtei* Hoffmeyer. det. Hoffmeyer 29” belongs to *T. microcerus* (Walker).

*Torymus scoparii* Hoffmeyer: **holotype**, ♀, (MCSN): “C32-45, France Var Hyères, H.L. Parker collector, *Torymus* sp. ♀ ♂ da *Asphondylia sarothamni*, Mus. Civ. Genova, *Callimome scoparii* Hoffmeyer Type”.

*Torymus tripudians*: Graham: **holotype**, ♀, (BMNH): “FRANCE: Vaucluse, Mont Ventoux, Combe Brune, 3.ix.1986, in a large swarm on foliage of *Fagus sylvatica* (Graham)”. **Paratypes**: 33 ♀ ♀ (BMNH, MNHN), same data as holotype; 24 ♀ ♀ same data as holotype, but 23.vi.1887, 2 ♂ ♂, 7 ♀ ♀, same data but Font d’Angiou, 1.vii.1988; 24 ♀ ♀ same but 25.vii.1988; 21 ♀ ♀, Mont Ventoux, Col de Perrache 15.viii.1983; 1 ♂, 8 ♀ ♀ 28.vii.1984, Mont Ventoux, Mont Serein; 6 ♀ ♀, same data but 25.vi.1987 (all in BMNH).

Comments.— *Torymus sarothamni* Kieffer: the original material has been reared in NE France from *Asphondylia pilosa* on *Cytisus scoparii*. Two females, “England, Berkshire, Emmer Green, SU718773, reared -/7/94 from pod galls of *Asphondylia sarothamni* on *Sarothamnus* (D.G. Notton)” agree very well with the original description of *T. sarothamni*. They are conspecific with *T. phillyreae* Ruschka. It is possible that *sarothamni* is the valid name for *phillyreae* but as more species have been reared from *Asphondylia* galls on broom we are taking a cautious view.

*Callimome schiödtei* Hoffmeyer: the holotype differs from *phillyreae* only in having the ovipositor sheath slightly shorter than the gaster, index 1.15-1.2. However, the

ovipositor sheaths are missing in the holotype, although the ovipositor itself is present; it is sharply bent upwards at a short distance from the tip of the gaster. One wonders if perhaps the specimen has an abnormal, slightly distorted, ovipositor.

*Torymus scoparii* Hoffmeyer: the holotype differs from *phillyreae* only in having the hind coxa slightly more hairy (about 8 hairs instead of the usual 1-4. Parker and Thomson reared the species from *Asphondylia sarothamni* on *Calicotome spinosa* (L.) Link (Leguminosae). They collected the galls near Hyères in France. Gijswijt collected the galls near Hyères in 1996, and obtained males and females *Torymus phillyreae*. Some of the specimens have slightly longer ovipositors: index 1.85 and the hind coxae bear up to 10 setae. Otherwise there are no significant differences between these specimens and typical *phillyreae* females.

*Torymus tripudians* Graham: Graham compared the respective types. The holotype of *tripudians* agrees in all structural details with the lectotype female of *T. phillyreae* Ruschka, it therefore becomes a junior synonym of *phillyreae*. The male specimen of *phillyreae*, designated paralectotype, also agrees with the description of male *tripudians* (1993: 20) and its paratypes. The syntypes of *phillyreae* differ only in colour from those of *tripudians*, being blue instead of green to blue-green.

Biology.— The species seems to have a whole range of hosts. The abundance in which it occurs in places (see remarks on swarming behaviour in Graham, 1993) suggests very common hosts. Until now it has been reared in Italy from galls of *Braueriella phillyreae* on *Phillyrea*; in Britain from *Asphondylia sarothamni* (Loew): on *Cytisus scoparii*; in Spain from *Stictodiplosis scrophulariae* Kieffer. on *Scrophularia peregrina*. In that country *phillyreae* was rather abundant on *Genista florida* in several places. In France from *Asphondylia sarothamni* on *Calicotome spinosa*. Gijswijt collected in Southern France, near Aix en Provence about 600 galls of *Braueriella phillyreae* from which emerged (besides other non-torymid species) 18 males and 51 females of *T. phillyreae*.

Variation.— The length of the ovipositor sheaths normally is 1.5-1.7 that of the hind tibia. Ruschka gives a ratio of 1.75. In Spain Gijswijt found several specimens of a form with relatively longer ovipositor (o.i. 1.9-2.1, one with o.i. 1.8) on *Genista florida*. As no other morphological differences can be found, he considers it to be a form of *T. phillyreae*.

Distribution.— France, Great Britain, Greece, Italy, Spain.

#### *Torymus poae* (Hoffmeyer), 1930

? *Cynips graminis* Geoffroy in Fourcroy, 1785: 385-386, ♀.

*Callimome poae* Hoffmeyer, 1930a: 26, ♂ ♀, 1930c: 238.

*Torymus poae* Sellenschlo & Wall, 1984: 27; Grissell, 1995: 286.

Type material.— *Callimome poae* Hoffmeyer: **lectotype**, ♀, (MNHN): here designated, on a minutien pin, stayed with a ♂ on a pith block, labelled "MUSEUM PARIS COLL. GIRAUD 1877"; "*Callimome poae* Hoffmeyer Type" "type" (in red lettering).

Biology.— Reared from *Poomyia poae* Bosc.

Distribution.— Germany.

*Torymus problematicus* spec. nov.  
(figs 174-175)

Type material.— **Holotype**, ♀, (BMNH): "England: Mx Southgate 4) 7.9.1968, M. de V. Graham Brit. Mus. 1983-2", **Paratypes**: 6 ♀♀ (BMNH) topotypic; 2 ♀♀ (MJG) "England Mx Southgate (3) 24.8.1970, M. d V, Graham Brit. Mus. 1983-2."

Description of female.— Morphology: head in dorsal view (fig. 174) 2.1 times as broad as long; temples 0.16-0.18 apparent length of eyes, very strongly converging and slightly curved. POL 2.2 times OOL, OOL 1.05 times OD. Vertex finely alutaceous, with several minute punctures. Frontally seen the eyes are separated 0.9 times their length. Mouth 1.86 times malar space, the latter 0.32-0.37 length of eye; genae straight. Antennae (fig. 175) with toruli well above lower eyeline but very slightly nearer to clypeus than to anterior ocellus; scape four times as long as broad, reaching middle of anterior ocellus, virtually as long as transverse diameter of eye; pedicellus plus flagellum about 1.3 times as long as breadth of head, flagellum proximally slightly stouter than pedicellus; funicle filiform, only clava broader than rest of flagellum; anellus 1.3-1.5 times as broad as long; pedicellus 1.8-1.9 times as long as broad; F1 slightly shorter than pedicellus, following segments slightly elongate or quadrate, F5-F7 quadrate; sensilla numerous uniseriate.

Mesosoma 1.75-1.9 times as long as broad. Mesoscutum 1.25 times as broad as long, with numerous very small punctures, at least twice their diameter apart; setae of normal length, slightly raised, sculpture in frontal half more or less rippled. Scutellum 1.3 times as long as broad, punctures as on mesoscutum, setae on posterior third longer, base rounded; flange very narrow, finely trabeculate. Dorsellum smooth with a trace of a sulcus. Propodeum smooth with a row of small fovea basally. Mesepimeron 1.35 times as high as broad, distinctly shorter than mid coxa. Hind leg with coxa 2.2-2.3 times as long as broad with hind edge moderately to strongly curved, thickly pilose in basal half, rather coarsely reticulate, the reticulation in basal two-third slightly raised, femur 3.6-3.75 times as long as broad, spur of tibia 0.45 length of basitarsus. Forewing 2.5 times as long as broad; costal cell nine times as long as broad, with one row of setae in upper surface in distal half, and one row plus scattered setae except in the middle on lower surface; basal vein with four to seven setae; speculum mainly open, extending beyond parastigma; M:PM:ST=67:15:6.5, stigma nearly sessile, oblique, small.

Gaster slightly compressed, basal sternite projecting by about one-quarter beyond hind coxa; hypopygium extending slightly beyond three-quarters of gaster, bare. Ovipositor index 1.5-1.66, as long as gaster or slightly longer. Length 2.1-2.6 mm.

Colour: body bright green to blue-green. Palpi testaceous or brownish. Antennae black, scape testaceous beneath. Coxae, hind femora except bases and tips, as body; fore and mid femora fuscous ventrally; hind tibiae broadly to mainly black; tarsal segment 5 fuscous, 4 brownish. Tegulae testaceous, more or less infuscate posteriorly. Wings hyaline, venation testaceous.

Male.— Unknown.

Comments.— The female of *problematicus* spec. nov. closely resembles that of *galii* Boheman, which differs in having mouth slightly broader (2.1-2.15 times malar space) and malar space slightly shorter (0.28-0.3 times length of eye), the antennal scape not

or just reaching lower edge of anterior ocellus, its length somewhat less than transverse diameter of eye; pedicellus plus flagellum 1.07-1.25 breadth of head, flagellum thickening slightly distad, F7, F6 and sometimes F5 very slightly transverse, mesosoma 1.55-1.8 times as long as broad. *T. galii* also tends to be smaller in size.

Biology.— Unknown.

Distribution.— Great Britain.

*Torymus pulchellus* Thomson, 1876  
(figs 176-179)

*Callimome Aerope* Walker, 1848a: 219.[♀, preoccupied].

*Torymus pulchellus* Thomson, 1876: 98; Eady, 1959: 268; Graham, 1969: 67; Sellenschlo & Wall, 1984: 27.

*Callimome pulchellum*; Hoffmeyer; 1930c: 243.

Type material.— *Callimome Aerope* Walker: no trace of Walker's material of male *aerope* had been found in BMNH (Eady, 1959: 268).

*Torymus pulchellus* Thomson: **Iectotype**, ♀, (ZIL): selected by Graham, validated by Hansson (1992: 11); labelled "ar" in Thomson's hand [Arrie, in Skåne].

Comments.— Eady placed *aerope* in synonymy with *pulchellus* Thomson on the basis of the female described by Walker in 1848 (which, however, is not a syntype). The present authors have not been able to recognise the male of *pulchellus* with certainty. We consider *aerope* Walker, 1844, ♂ to be a synonym of *microcerus* (Walker) from the description, which is quite good (see under *microcerus*) and *aerope* Walker, 1848, ♀ a (preoccupied) synonym of *pulchellus*. The females of *pulchellus* vary much in colour. Some have the body extensively or wholly golden or coppery-golden, others are green. The legs vary from pale yellow to ochroceous yellow.

Biology.— Unknown. The species is associated with *Salix* (Graham has swept it from foliage of *S. fragilis* and *S. alba*).

Distribution.— France, Great Britain, Ireland, Netherlands, Sweden.

*Torymus pulcher* Boucek

*Torymus pulcher* Boucek, 1996: 43-45, ♂ ♀.

Type material.— **Holotype**, ♀, (NMP): Czech Republic, Bohemia Velky Vrestov 25.vii.1994. **Paratypes**: 1 ♂ and 1 ♀ (BMNH), same data as holotype, 2 ♂♂ (NMP), same data but 10.viii.1956 and 8.viii.1993.

Biology.— Unknown.

Distribution.— Czech Republic.

*Torymus purpureae* spec. nov.  
(fig. 180)

Type material.— **Holotype**, ♀, (BMNH): "France: Alpes de Haute Provence, St. Vincent de Jabron, em. 7.ix.84, e gall of *Rhabdophaga* sp. on stem of *Salix purpurea* M. de V, Graham". **Paratypes**: 1 ♀ (BMNH), topotypic, same data as holotype; 2 ♀ (BMNH, MJG), topotypic, em. 10.ix.84; 1 ♀ (BMNH), topotypic, em. 17.ix.1984; 1 ♂ (BMNH), topotypic, em. 1.ix.1984.

Description of female.— Morphology: head in dorsal view twice as broad as long, temples 0.25 apparent length of eye, strongly convex, rounded. POL 1.7-1.75 OOL, OOL 1.3-1.4 OD. Vertex finely reticulate, with several minute and inconspicuous punctures. In frontal view, the head is trapeziform with straight genae. Mouth 2.12 times length of malar space, the latter 0.33 length of eye. Clypeus is hardly produced, virtually truncate. Antenna (fig. 180) with toruli well above lower eyeline; scape 3.7 times as long as broad, not reaching anterior ocellus; pedicellus plus flagellum 1.6 times breadth of head, flagellum proximally hardly stouter than pedicellus, weakly clavate; pedicellus 1.85 times as long as broad; anellus slightly transverse; F1 1.4-1.6 times as long as broad, approximately as long as pedicellus, F2-F4 or F5 slightly elongate, F5 or F6 quadrate, F7 quadrate or very slightly transverse; clava 1.9 times as long as broad; sensilla numerous, uniseriate.

Mesosoma 1.95 times as long as broad; mesonotum 1.3 times as broad as long, finely reticulate, slightly rippled in frontal half, punctures numerous, minute and wide apart, setae of average length, hardly raised. Scutellum 1.3 times as long as broad, sculpture, including punctures, as mesoscutum, setae on hinder half long and distinctly raised; flange very narrow, with weak irregular trabeculae. Dorsellum nearly smooth, with a trace of a fovea. Propodeum very delicately alutaceous, with a row of small fovea along base. Mesepimeron 1.55 times as high as broad, distinctly shorter than mid coxa (19:32). Fore femur with some long curved setae. Hind coxa 2.3 times as long as broad, rather thickly pilose in frontal half to third, hind edge strongly curved, rather finely reticulate, raised in basal half and more or less engraved in distal half, there is a trace of a fine dorsal carina in basal half in some specimens. Forewing 2.75 times as long as broad; costal cell 10.5 times as long as broad, above with one row, beneath with one row plus scattered setae over distal half; basal cell with a few setae below SM, closed; basal vein with 5-7 setae; speculum extending slightly beyond parastigma, open. M:PM:ST=37:11:3.2, stigma shortly petiolate, small.

Gaster only slightly compressed, in profile appearing subtriangular (like that of *insolitus*, fig. ); basal sternite long, projecting beyond coxa by half the length of the coxa; hypopygium extending about 0.75 length of gaster, bare except tip. Ovipositor index 2.5-2.6, about as long as metasoma plus half mesosoma or slightly more. Length 2.5-5.0 mm.

Colour: bright green with strong golden to coppery tinge on vertex, face, pleuron, propodeum and sides of gaster. Antennae black, scape testaceous below in basal quarter to half. Coxae coloured as body but fore coxae partly yellow. Rest of legs yellowish-testaceous with fifth tarsal segments and claws brown. Hind femora sometimes with metallic-fuscous flush medially. Tegulae yellow. Wings hyaline, venation yellow.

Male.— Differs from female as follows: scape externally finely granulate, pedicellus plus flagellum about 1.5 times as breadth of head, flagellum very distinctly stouter than pedicellus, nearly cylindrical; pedicellus about 1.5 times as long as broad, hardly longer than F1; funicle segments very slightly elongate, except F6 and F7 which are quadrate, flagellum clothed with black curved setae. Body blue-green, scape black, all coxae like mesosoma, hind femora wholly metallic-black. Length 2 mm.

Comments.— The longer ovipositor, the light colour of the legs and the host distinguish the females of this species from the others in this group.

Biology.— Reared from galls of a *Rabdophaga* species on stem of *Salix purpurea*.

Distribution.— France.

*Torymus putoniellae* spec. nov.  
(fig. 181)

Type material.— **Holotype**, ♀, (RMNH): "France Aveyron M.J. Gijswijt" "NANT / gall *Putoniella marsupialis* on *Prunus spinosa* vii. 1982". **Paratypes**: 2 ♀♀ (MJG), "France Vaucluse St Pierre de Vassols em. 17.6.1985", 1 ♂ (MJG) same data as holotype; Austria: two pins with a ♂ and a ♀ each (NHMW), one is labelled " / *Dipl. marsupialis* Speising, 30.6.89. coll. Wachtl." "*T. pruni* Cam. det. Ruschka 21"; the second one has the text "*Cecidomyia pruni* Weidling coll. Wachtl" "*T. pruni* Cam. det. Ruschka 21"; 1 ♂ and 4 ♀♀ fixed on a pith block together with a *Copidosoma* (Encyrtidae) and a gall labelled "ex *Diplosis marsupialis* J. Lw. auf *Prunus spinosa*" Austr. inf. Speising 19.7.88 Wchtl" "*Tor. pruni* Cam."

Description of female.— Morphology: head in dorsal view twice as broad as long, temples slightly less than 0.20 apparent length of eye, strongly convex, straight. POL 1.85-1.9 OOL, OOL equals OD. Vertex finely reticulate near ocelli, more alutaceous near eyes, the reticulation tending to form transverse striae; punctures inconspicuous. In frontal view the genae are straight, the mouth is 2.3-2.4 times length of malar space, the latter 0.3 length of eye. Clypeus is slightly produced and rounded. Antenna (fig. 180) with toruli well above lower eyeline; scape 3.5 times as long as broad, not reaching anterior ocellus; pedicellus plus flagellum 1.4 times breadth of head, flagellum proximally not stouter than pedicellus, weakly clavate; pedicellus 1.6 times as long as broad; anellus transverse; F1 1.1-1.2 times as long as broad, as long as pedicellus, F2-F6 slightly elongate, F7 quadrate, clava 2.2 times as long as broad, sensilla in two overlapping rows.

Mesosoma 1.8 times as long as broad. Mesonotum 1.3 times as broad as long, finely reticulate, punctures inconspicuous, setae of average length, raised. Scutellum 1.45 times as long as broad, sculpture, including punctures, as mesoscutum, setae towards apex gradually longer and more raised; flange broad, with weak irregular trabeculae. Dorsellum nearly smooth, with a fovea. Propodeum delicately alutaceous, with a row of small fovea along base. Mesepimeron 1.3 times as high as broad, distinctly shorter than mid coxa (4:5). Hind coxa 2.3 times as long as broad, rather thickly pilose, reticulation normal, raised. Forewing 2.5-2.7 times as long as broad; costal cell, above with one row, beneath with one row plus scattered setae over distal half; basal cell with a few setae below SM, closed; basal vein with 5-7 setae; speculum extending to M, nearly closed. M:PM:ST=37:10:3.5, stigma petiolate.

Gaster only slightly compressed; basal sternite not projecting beyond coxa; hypopygium extending about 0.75 length of gaster, with 12-15 setae on posterior half. Ovipositor index 2.25-2.35, about as long as metasoma plus two-third mesosoma. Length 3.2 mm.

Colour: bright green with strong golden to coppery tinge on vertex, frontal half of mesosoma, pleuron and hind coxae. Antennae black, scape testaceous with a dark lining along dorsal edge. Fore coxae yellow, mid coxae slightly darkened, hind coxae green. Rest of legs yellowish-testaceous with fifth tarsal segments and claws brown.



Hind femora sometimes with metallic-fuscos flush medially. Tegulae yellow. Wings hyaline, venation testaceous, darkened towards stigma.

Male.— differs from female as follows: scape shorter externally finely granulate, pedicellus plus flagellum about 1.4 times as breadth of head, flagellum very distinctly stouter than pedicellus, nearly cylindrical, sensilla uniseriate; pedicellus hardly longer than broad, shorter than F1; F1 very slightly elongate, F2 to F4 quadrate, F5-F7 slightly transverse; flagellum clothed with black curved setae. Body blue-green. Length 2.4 mm.

Biology.— Reared from galls of *Putoniella marsupialis* Löw on *Prunus spinosa*.

Distribution.— Austria, France.

Comments.— The females resemble those of *T. microcerus*, which has been reared from the same host, but differs by its longer ovipositor and the smaller POL/OOL ratio (2.5 in *microcerus*). It can be distinguished from *fractiosus* by the characters mentioned in the key.

*Torymus pygmaeus* Mayr, 1874  
(figs 182, 261)

*Torymus pygmaeus* Mayr, 1874:120-121, ♂ ♀; Sellenschlo & Wall, 1984: 27; Grissell, 1995: 286.  
*Callimome pygmaeum*; Hoffmeyer, 1930c: 239.

Type material.— **Lectotype**, ♀, (NHMW): here designated, mounted on a minutien pin fixed on a pith block with a ♂ and labelled: "Collect. G. Mayr; *Torymus pygmaeus* G. Mayr, Type; *subulif.* May 72" [-Mayr's hand]; Graham's lectotype label. **Paratypes**: (NHMW): the ♂ fixed on the same block as the lectotype and a ♀ and a ♂ plus ♀, mounted on two pithblocks and similarly labelled. All here designated.

Comments.— Mayr reared 50 specimens, however, only 2 males and three females are in NHMW now. They are mounted on 3 pith blocks.

Biology.— Reared from galls of *Contarinia subulifex* Mayr (Dipt. Cecidomyiidae) on *Quercus cerris*.

Distribution.— Austria.

*Torymus quadriceps* spec. nov.  
(fig. 183)

Type material.— **Holotype**, ♀, (BMNH): "Wales, Morfa Harlech (1) 27.7.1971 M. de V. Graham". **Paratypes**: 3 ♀ ♀ (BMNH): topotypic; 1 ♀ (MJG), "FRANCE Dépt. Drôme M.J. Gijswijt; Saou 29.viii.1981 natte wei".

Description of female.— Morphology: head in dorsal view (fig. 183) 1.8-1.9 times as broad as long, temples 0.15 apparent length of eye; POL 2.1 OOL, OOL 1.25 OD; malar space 0.33-0.36 length of eye. Vertex finely reticulate with several minute punctures. Frontally seen the head is subcircular with slightly curved genae. Antennae with toruli well above lower eyeline but slightly nearer to clypeus than to anterior ocellus; scape 3.7 times as long as broad and reaching anterior ocellus; pedicellus plus flagellum 1.25 times breadth of head, flagellum proximally barely or just as stout as pedicellus, fairly strongly clavate; pedicellus 1.75 times as long as broad, distinctly

longer than F1; anellus very slightly transverse; F1 quadrate to 1.2 times as long as broad, as long as or very slightly shorter than F2; clava 2.1 times as long as broad; sensilla rather sparse, uniseriate.

Mesosoma 1.5-1.6 times as long as broad. Mesonotum 1.6 times as broad as long, somewhat dull, finely reticulate and hardly rippled in front, punctures numerous and fairly close, minute, setae relatively short, hardly raised. Scutellum 1.2 times as long as broad, sculpture and punctures as mesoscutum, setae of hind third long, base rounded to subtruncate; flange very narrow, weakly trabeculate. Dorsellum weakly alutaceous. Propodeum extremely finely alutaceous, with a row of minute fovea near base, spiracles very small: about 1.2-1.3 times as long as broad, about 2.5 times their diameter from hind margin. Mesepimeron 1.5 times as long as broad, distinctly shorter than mid coxa. Hind coxa about twice as long as broad, dorsal edge moderately curved with rather coarse, slightly raised reticulation, pilose; spur of hind tibia about half as long as basitarsus. Forewing 2.35 times as long as broad; costal cell 8.5 times as long as broad, with one row of setae (broken in the middle) on upper surface and one row plus scattered setae on lower surface (not in the middle); basal cell with 3-4 setae, closed; basal vein with 5-6 setae; speculum open or partly closed at apex, rather large and extending somewhat beyond parastigma. M:PM:ST=39:10:5, stigma shortly petiolate, slightly oblique.

Gaster broad, hardly compressed, in profile short and high; basal sternite hardly reaching beyond coxa; hypopygium reaching three quarters along gaster or slightly beyond, bare, except very few setae at tip. Ovipositor index 1.35-1.5, slightly shorter or as long as metasoma. Length 1.4-1.6 mm.

Colour: body bright green to greenish-blue. Antennae black, scape testaceous beneath, coxae, and hind femora except base and tip, as body. Legs otherwise testaceous with fore and mid femora slightly infuscate proximally, hind tibia more or less infuscate medially, in a dark specimen from France fore and mid femora and all tibiae infuscate, fore tarsi brown, mid and hind tarsi with fifth segments fuscous, fourth brownish. Tegulae testaceous anteriorly, otherwise brown. Wings hyaline, venation testaceous. Gaster with tergite two and three (sometimes also four) bronze.

Male.— Unknown.

Comments.— The female of *T. quadriceps* is very close to that of *heyeri* Wachtl, which differs in the diagnostic characters noted in the key to females, couplet 151.

Biology.— Unknown.

Distribution.— France, Great Britain.

*Torymus quercinus* Boheman, 1834  
(figs 184-185, 262)

*Torymus quercinus* Boheman, 1834: 373, ♀; Mayr, 1874: 101; Thomson, 1876: 84; Eady, 1959: 268, in part.; Boucek, 1977: 26; Boucek & Graham, 1978a: 227; Sellenschlo & Wall 1984: 27; Grissell, 1995: 286.

*Callimome quercinus*; Hoffmeyer, 1930c: 237.

*Torymus macrocentrus* Ratzeburg, 1852: 224.

Type material.— *Torymus quercinus* Boheman: **lectotype**, here designated: a ♀ .(NR) labelled "Sm" (Småland) and "Bhn".

*Torymus macrocentrus* Ratzeburg: no lectotype has been selected.

Comments.— *Torymus quercinus* Boh.: three female specimens stand in the Boheman collection, one has been selected as lectotype by Graham. Eady (1959: 268) placed *Callimome tarsalis* Walker (1833: 134) in synonymy with *Torymus quercinus* Boheman, following Walker (1846: 17) though he had not found any original material. A female which represents *tarsalis* has since been found (see under *T. affinis*).

*Torymus macrocentrus* Ratz.: Boucek (1964: 670) reported that there were 4 females and 2 males under this name in the remnants of Ratzeburg's collection in Eberswalde, labelled "Gall. petio. Tremulae"; they were referable to *quercinus* Boheman. The females are doubtless syntypes but no lectotype has been selected. Mayr (1874: 101) had already placed *macrocentrus* in synonymy with *quercinus*.

Biology.— Reared from galls of *Harmandia petioli* Kieffer (Dipt. Cecidomyiidae) on *Populus tremula*.

Distribution.— Czech Republic, Germany, Great Britain, Sweden, Yugoslavia (Montenegro).

*Torymus ramicola* Ruschka, 1921  
(figs 186-187)

*Torymus ramicola* Ruschka, 1921: 337, ♂ ♀; Sellenschlo & Wall, 1984: 27; Grissell, 1995: 286.  
*Callimome ramicola*; Hoffmeyer, 1930c: 238.

Type material.— **Lectotype**, ♀, (NHMW): here designated, a female pinned on a pith block with a male, labels: "e *Diplosis ramicola* coll. Wachtl"; "*T. ramicola* Ruschka, Type"; "Type" (red label).

Comments.— Ruschka described the ovipositor of *T. ramicola* as 7.5-8 times the length of the hind tibia. This is clearly a mistake; in the lectotype the ovipositor sheaths are about four times the length of the tibia.

A second group mounted on another pith block, consists of three females which disagree with the description in having the ovipositors shorter than the body; they are labelled "Collect. G. Mayr"; "*Torymus* aus *Diplosis ramicola* Kieffer". We reject these as not being syntypes.

Biology.— Reared from *Diplosis ramicola* Kieffer (Dipt. Cecidomyiidae) on *Artemisia*.  
Distribution.— Austria.

*Torymus regalis* (Walker, 1833)

*Callimome regalis* Walker, 1833: 119, ♂.  
*Callimomus regalis*; Eady, 1959: 258-259.  
*Torymus regalis*; Boucek, 1977: 26; Sellenschlo & Wall, 1984: 19; Grissell, 1995: 286.

Type material.— **Lectotype**, ♂, (BMNH): designated by Eady (1959: 258).

Comments.— *T. regalis* is very close to *laetus* (Walker) but seems to be distinct (see characters given in key, couplet 45). The male can be distinguished from that of *laetus* by having scape reaching at most lower edge of anterior ocellus, its length hardly greater than transverse diameter of eye; head and thorax dark blue to violet, gaster more coppery or fiery; forewing usually with brownish streak or cloud discally.

Biology.— Unknown.

Distribution.— France, Great Britain, Yugoslavia (Montenegro).

*Torymus rhamni* Boucek, 1994  
(fig. 188)

*Torymus rhamni* Boucek, 1995: 83-85, ♀; Grissell, 1995: 286.

Type material.— **Holotype**, ♀, (BMNH): Austria: Klosterneuburg nr. Vienna, 30.vii.1964 (R. Sobhian).  
**Paratype**: ♀, (BMNH), topotypic.

**Biology**.— Reared from fruits of *Rhamnus cathartica*.  
**Distribution**.— Austria.

*Torymus roboris* (Walker, 1833)  
(figs 189-190)

*Callimome Roboris* Walker, 1833: 120, ♂ ♀.

*Torymus roboris*; Boucek & Graham, 1978a: 227; Graham, 1994a: 32-33; Grissell, 1995: 286.

*Torymus nitidulus* Nees, 1834: 64, [♀, not ♂]. **Syn. nov.**

[*Torymus nobilis*; Eady, 1959: 262, in part. Misidentification].

Type material. **Lectotype** of *Torymus roboris* Walker, ♀ (OUM), designated by Graham (1994: 32-33), labelled in Walker's hand "*Callimome Roboris* " and two other more recent labels "ROBORIS one of two Nom. in coll. Hope-Westw. in 1949" and "*Callimome roboris* Walker, M. de V. Graham det. 1975 LECTOTYPE ♀".

*Torymus nitidulus* Nees. Original material destroyed.

**Comments**.— *Torymus roboris* Walker: Eady (1959: 262) stated that he had not found any Walker material of this species in BMNH. Graham later found 3 females and 1 male in the Haliday collection (NMI) and Westwood collection (OUM). On the basis of these Boucek & Graham (1978: 227) pointed out that *roboris* was distinct from *nobilis* Boheman. Graham (1994: 32-33) designated a female in OUM as lectotype of *roboris*. It is labelled in Walker's hand "*Callimome Roboris* " and bears two other more recent labels "ROBORIS one of two Nom. in coll. Hope-Westw. in 1949" and "*Callimome roboris* Walker, M. de V. Graham det. 1975 LECTOTYPE ♀" Some characters distinguishing female *roboris* and *nobilis* were also given.

*Torymus nitidulus* Nees. The description of the female fits *roboris* well, except the statement "tibiae apice fuscae", which looks like a mistake as no *Torymus* has this character. Nees also took his material from foliage of oak, which accords with the habitat of *roboris*.

In southern Britain at least, this species seems to be more abundant than *nobilis* Boh. Graham has taken many specimens in the type locality of Southgate, some from old *Quercus* on the former Walker estate, including the ancient Chandos Oak.

**Biology**.— Reared from galls of *Biorhiza aptera* (Fabr.), (form of *B. pallida* (Olivier) on roots of *Quercus*).

**Distribution**.— Czech Republic, France, Germany, Great Britain, Netherlands, Slovakia, Yugoslavia (Slovenia).

*Torymus rosariae* spec. nov.  
(figs 191-192, 163)

Material.— **Holotype**, ♀, (RMNH): Netherlands “Bloemendaal 21.iii.1961 M.J. Gijswijt, uit gal *Rhabd. rosaria*, remounted 1993 M.J. Gijswijt”. **Paratypes**: (RMNH, MJG, ZMA): Netherlands, 1 ♂ topotypic, 15.iii.1961; 1 ♀ topotypic, 17.iii.1961; 2 ♀♀, 1 ♂ topotypic, 20.iii.1961; 1 ♀ “Zandvoort 30.v.1960 M.J. Gijswijt, uit gal *Rhabdoph. rosaria*”; 2 ♀♀ “Terschelling 21.iv.1957 M.J. Gijswijt, e galla *Rhabdophaga rosaria* L.”; 2 ♀♀, “Hilversum 13.vi.1957 M.J. Gijswijt”; 2 ♀♀ “Hilversum (N) 17.iii.1957 M.J. Gijswijt, uit gal *Rhabd. rosaria*”; 1 ♀ “Kenn. duin, 28.iv.1963, M.J. Gijswijt, / *Rhabd. sp.*”; 1 ♀ “Zandvoort gal *Rhabdoph. ros.* B. Nübel, 1.v.1977”; 2 ♀♀ “Aerdenhout (A-W-D) 13.ii.1983 M.J. Gijswijt, galls *Rhabd. ros.* on *Salix repens*”; 1 ♂ “Vogelenzang 17.v.1966 W. Nijveldt, uit depot *Rhabd. rosaria* op *Salix repens* coll. 8.iii.1966”; 6 ♀♀ “Vogelenzang 27.v.1967 W. Nijveldt, uit depot *Rhabd. rosaria* op *Salix repens* coll. 8.iii.1966”; 1 ♀ “Amsterdam 27.v.1942 uit *Cecidomyia rosaria* Linn., coll. W.H. v. der Reek acq. vi.1945”; 1 ♂, “*Torymus tipulariarum* ♂. Zett. Bodegraven uit gallen v. *Cecidomyia rosaria*. de M.”; 2 ♀♀, 1 ♂ m “*Torymus tipulariarum* ♀ Zett. Bloemendaal Mei 1891 de M. uit gal. v. *Cecidomyia rosaria* Löw. 1 ex. in elke gal”; Germany, 1 ♀ “Deutschland Baden Württ. M.J. Gijswijt, Stetten am k/M 14-18.vii.1972 in weide”; 2 ♀♀ “Deutschland Lübeck (Waakener Ufer) H. Meyer leg., *Rhabdophaga* spp. winter 1980-81”; 5 ♀♀, 5 ♂♂, “Deutschland Lübeck (Waakener Ufer) H. Meyer leg., / *Rhabdophaga rosaria* & *heterobia* i-iv 1981”; Czech Republic: 2 ♀♀ (ZB), “Hradec Kral. Vekose. 1947 ed. Boucek., ex *Rhabdophaga rosaria*, *Torymus tipulariarum* Zett.”; Slovakia: 2 ♀♀ (ZB), “Slov. Samarín Dunaj. *Rhabd. rosaria*, iv.53 Bck”; 1 ♀, 2 ♂♂ (RRA), “ex galls *Rhabdophaga ?iteobia*, *Salix ?purpurea* lg 1.xii.86 Hessen FRG M. Boness”.

Description of female.— Morphology: head in dorsal view (fig. 191) 1.95-2.15 times as broad as long; temples 0.25-0.28 length of eye, moderately convex, distinctly rounded; POL 1.95-2.0 OOL, OOL 1.25 OD. Vertex with a number of very small punctures. Frontally seen (fig. 192) the mouth is 2.2 times as long as malar space, which is 0.34 length of eye; genae are slightly curved. Clypeus (fig. 263) truncate or very shallowly emarginate. Antennae: with toruli well above lower eyeline; scape not reaching anterior ocellus; pedicellus plus flagellum 1.27 times as long as breadth of head, flagellum proximally slightly broader than pedicellus, weakly clavate; pedicellus 1.7 times as long as broad; anellus subquadrate; F1 as long as or slightly shorter than pedicellus, F2 and F3 slightly elongate or quadrate, following segments quadrate, F7 very slightly transverse. (in small females all funicle segments are quadrate except F7, which is very slightly transverse); clava twice as long as broad; sensilla numerous, uniseriate.

Mesosoma 1.95 times as long as broad. Mesoscutum 1.3 times as long as broad with fine reticulation, but tending to form transverse ripples in anterior third, punctures very numerous but minute, setae rather short, only very slightly raised. Scutellum 1.2 times as long as broad, with subtruncate base, sculptured as mesoscutum, setae slightly raised, those of posterior third long, flange very narrow, not distinctly trabeculate or with very fine trabeculae. Dorsellum nearly smooth. Propodeum with delicate superficial alutaceous sculpture, smoother medially. Mesepimeron about 1.4 times longer than broad and nearly as long as mid coxa. Hind leg with coxa 2.3 times as long as broad, pilose in basal half dorsally; femur 3.6-3.8 times as long as broad, spur of tibia 0.47 length of basitarsus. Forewing 2.5 times as long as broad; basal cell with a few setae below SM, closed distally, basal vein with 3-5 setae; speculum not broad, extending slightly beyond parastigma, partly open. M:PM:ST=64:17:6.9, ST shortly petiolate, small.

Gaster slightly compressed; basal sternite projecting slightly beyond coxa; hypopygium extending 0.75 along gaster, bare except tip. Ovipositor sheaths as long as metasoma plus 0.3 mesosoma or slightly longer, index 1.7-2.05. Length 2.3-3.5 mm.

Colour: body bright blue-green to blue; mesepimeron wholly brassy or bronze; scape black, yellow beneath. Coxae, usually basal two-third of fore and mid femora, as body rest of legs yellow, with hind tibiae weakly to strongly and broadly infuscate, fifth tarsal segment fuscous. Tegulae yellow. Wings hyaline, venation yellowish.

Male.— Differs from female as follows: pedicellus plus flagellum 1.4 times breadth of head, anellus slightly transverse, pedicellus shorter, not longer than F1; flagellum stouter, distinctly broader than pedicellus, nearly cylindrical, all funicle segments quadrate. All femora black-metallic except tips.

Comments.— The species can be distinguished from the related ones by the characters mentioned in the key to females.

Biology.— Reared from galls of *Rabdophaga rosaria* Loew) (Dipt. Cecidomyiidae) on *Salix repens*.

Distribution.— Czech Republic, Germany, Netherlands, Slovakia.

*Torymus rubi* (Schrank, 1781)  
(figs 193-195)

*Cynips Rubi* Schrank, 1781: 320-322, ♀.

*Torymus rubi*; Boucek & Graham, 1978a: 227; Grissell, 1995: 286-287.

*Callimome macropterus* Walker, 1833: 124, ♀.

*Torymus macroptera* [sic]; Mayr, 1874: 114-115.

*Torymus macropterus*; Thomson, 1876: 95; Eady, 1959: 263.

*Torymus splendidus* Foerster, 1840: xxx, ♂ ♀; Grissell, 1995: 288. **Syn. nov.**

?*Torymus acrophilae* Ruschka 1921: 341, ♀; Grissell, 1995: 274.

*Callimome abbreviatum* (Boheman) var. *macropterus*; Hoffmeyer, 1930c: 244.

Type material.— *Cynips rubi* Schrank: no type material found.

*Callimome macropterus* Walker: **lectotype**, ♀, (BMNH): designated by Eady (1959: 263) [examined]. It bears the BMNH label Type Hym. 5.1570.

*Torymus splendidus* Foerster: **lectotype**, ♀, (NHMW): here designated, labelled "Or. Ex"; a tiny green ticket; "Coll. G. Mayr"; "*Tor. splendidus* Förster, Type"; "Aachen". Paralectotypes: (NHMW), one mount bearing three females and three males, together with a piece of a *Rubus* stem gall. It bears a label "aus holzigen Gallen von *Rubus*".

*Torymus acrophilae* Ruschka. No original material found.

Comments.— *Cynips rubi* Schrank: Schrank's description is brief but his reference to the insect having emerged from swellings on twigs of *Rubus caesius* and his mention that the ovipositor was shorter than the body, leave no doubt regarding the identity of *rubi*.

*Torymus splendidus* Foerster: the label "Or. Ex." means Original Exemplar. Foerster used to attach it to his early material upon which he had based his descriptions. The female with this label is therefore designated lectotype. This lectotype lacks the flagellum of the right antenna and the ovipositor sheaths (though the ovipositor itself is present). It agrees well with the description; in particular there is a longitudinal golden mark in the middle of the propodeum, which in certain positions catches the light and thus fits his words "stark goldgelb glänzend". All types belong to *rubi*. Foerster (1840: 5, 1841: 7) stated that he had reared his *T. splendidus* from galls of *Aylax glecho-*

*mae*, which is clearly a mistake. No *Torymus* agreeing with the description of *splendidus* has since been reared from these galls.

*Torymus acrophilae* Ruschka: the syntypes mentioned (Austria: 2 ♀♀, Prater [Vienna], Weidling; 2 ♀♀, Lundenburg) were reared by Wachtl from *Perrisia acrophilae* Winnertz (Dipt. Cecidomyiidae). This host forms galls on leaves of *Fraxinus*. Dr. Z. Boucek kindly loaned a female *Torymus* (Croatia, Otok near Vincovci) reared 15.vi.1972 from *Stereonychus fraxini* (Col., Curculionidae) by J. Miklos. It agrees rather well with the description of *T. rubi* (Schrank). This raises the possibility that *rubi* may have alternative hosts on *Fraxinus*, in addition to its more usual host on *Rubus*.

Another interesting data is emerging regarding the host-range of *rubi*. In the collection of the Agricultural University of Wageningen we noticed males and females of a *Torymus* reared from a gall on *Pteridium* (The Netherlands, Ov. Gorssel, 4.v.1986, by an unknown student). These are indistinguishable from nominotypical *rubi* (Schrank). In this connection an earlier published note is interesting: Müller (1871, *Zoologist* (2)6: 2651 gave an account of a gall on the stem of bracken (*Pteridium*) found at Shirley, resembling that of *Diastrophus rubi*. From this gall Rothney had reared in March 1968, some Cynipidae and two specimens of a *Callimome* (= *Torymus*). Müller consulted Schenk's work on Cynipidae and was convinced that Rothney's gall was *Diastrophus rubi*. The gall was as big as a large pea and composed of a number of small larval cells. The gall was curved and Müller suggested that the cynipid had probably deposited eggs upon the tip of a frond, which caused the gall to be curved as the frond expanded. It looks as though *Torymus rubi* has alternative hosts upon *Pteridium* in addition to its more usual host on *Rubus*.

1 ♀ *rubi* (BMNH) "ex gall of *Rhodites rosae* L. em. 1933; G. Salt via *Davana*. *Torymus macropterus* Walk. ♀. det. Callem 1936". Several ♀♀ (MJG), from galls of *Rhodites rosae* collected in The Netherlands.

Colour variation.— Legs normally yellow-testaceous including fore coxae partly or mainly. In a few dwarfs hind femora are more or less infuscate, sometimes hind tibiae slightly so. Ovipositor index normally 2.1-2.4 (in one dwarf only 1.9).

Biology.— Reared from galls of *Diastrophus rubi* (Bouché), *Diplolepis rosae* (Linnaeus) (Hym. Cynipoidea), *Perrisia acrophilae* Winnertz, a gall on *Pteridium aquilinum* (Dipt. Cecidomyiidae), *Stereonychus fraxini* on *Fraxinus* (Col. Curculionidae).

Distribution.— Austria, Belgium, Croatia, Czech Republic, France, Germany, Great Britain, Netherlands, Poland, Spain.

*Torymus ruschkai* (Hoffmeyer, 1929)  
(figs 196-198)

?*Torymus approximatus* Foerster, 1840: xxx-xxxi, ♀; Grissell, 1995: 275.

*Torymus tubicola* Ruschka, 1921: 340, ♂♀ (preocc. by *Callimome tubicola* Osten Sacken, 1870: 60).

*Callimome ruschkai* Hoffmeyer, 1929: 334 (nom. n. for *tubicola* Ruschka, nec Osten Sacken); Hoffmeyer, 1930c: 242, 252, ♂♀.

*Torymus ruschkae* [sic], Sellenschlo & Wall, 1984: 27.

*Torymus ruschkai*; Grissell, 1995: 287.

Type material.— *Torymus approximatus* Foerster: **lectotype**, ♀, (NHMW): here designated, labelled: "(1) a tiny green square, (2) Collect. G. Mayr, (3) *Meg. approximatus* Förster, Type (4) *Torymus approximatus* Förster, Type (5) Aachen.

*Torymus tubicola* Ruschka: **lectotype**, ♀, (NHMW): here designated: labelled "*Cec. tubifex* Znaim 15.8.90 Coll. Wachtl"; "*T. tubicola* Ruschka, Type"; "Type" (red label); In coll. Vienna Museum as *Torymus tubicola* Ruschka nr. 345", mounted with a ♂ on one block. **Paralectotypes**: the remaining specimens. Further syntypes in NHMW (all here designated paralectotypes): (1). 2 ♂♂, 4 ♀♀ on pith block, labelled "19; Moravia Znaim 15.8.90 Wachtl; *Torymus tubicola* Ruschka Type". (2). Block with 1 ♀, "Moravia Znaim 1.9.904 Wachtl; ♀; ex *Rhopal. tubifera* Bché"; a blue label. (3) Block with 1 ♀, "Moravia Znaim 24.8.904 Wachtl"; other labels as (2). (4) Block with 1 ♀, "Moravia Znaim 20.8.904 Wachtl"; other labels as (2). (5). 1 ♀, remounted by Dr. Boucek in 1978; labels transcribed from those of (2).

Comments.— *Torymus approximatus*. The lectotype lacks the antennal flagella and the ovipositor (but Foerster stated that the latter was not longer than the gaster). From a series of measurements and a direct comparison with the lectotype of *tubicola* Ruschka (= *ruschkai* Hoffmeyer) we think it might be conspecific, but in view of the absence of flagellum and ovipositor in *approximatus*, we cite it only as a possible synonym of *ruschkai*.

NB: fig 197 shows the head in lateral view to demonstrate the bare shiny triangle on gena behind malar sulcus.

Biology.— Reared from *Misospatha tubifex* (Bouché) (Dipt. Cecidomyiidae) on *Artemisia campestris*.

Distribution.— Czech Republic, Denmark, Poland, Spain.

*Torymus salicis* Graham, 1994  
(figs 199-202, 264)

*Torymus salicis* Graham, 1994a, ♀; Grissell, 1995: 287.

Type material.— **Holotype**, ♀, (BMNH): Sweden, Skåne, Sjöholmen, shore of Ringsjön, 31.vii.1959, swept from a *Salix* bush (Graham). **Paratypes**: 3 ♀♀ (BMNH): same data as holotype; 1 ♀ (BMNH) Great Britain: Dorsetshire, Studland, 7.ix.1962 (Graham).

Male unknown.

Biology.— Associated with *Salix*.

Distribution.— Great Britain, Netherlands, Sweden.

*Torymus scandicus* spec. nov.  
(fig. 203)

Material.— **Holotype**, ♀, (BMNH): "Sweden, Sk. Höör distr. 13.vi.1938. D.M.S. & J.F.P. [Perkins]. B.M. 1938-414". **Paratypes**: 1 ♀ (BMNH), same data as holotype, 1 ♀ (BMNH) same data as holotype, but 21.vi.1938.

Description of female.— Morphology: head in dorsal view (fig. 203) 1.9 times as broad as long, temples 0.33 apparent length of eyes, moderately convex, well rounded; POL twice as long as OOL, OOL 1.15 OD. Vertex with fine sculpture, scattered with small punctures. In frontal view mouth is about 2.4 times as long as malar space, which is 0.35 times as long as eye. Clypeus very slightly produced, broadly subtruncate. Genae somewhat curved. Antennae with toruli distinctly above lower eyeline, but slightly nearer to clypeus than to anterior ocellus; scape three times as long as broad, hardly reaching ocellus; pedicellus plus flagellum 1.21 as long as breadth of



head, flagellum proximally as broad as breadth of pedicellus, moderately clavate; F1-F5 quadrate, F6 and F7 very slightly transverse; clava twice as long as broad; sensilla sparse on F1 and F2 and fairly numerous on the other segments, uniseriate.

Mesosoma 1.7 times as long as broad, moderately arched, propodeum having an angle of 45°. Mesoscutum 1.4 times as broad as long, extremely finely transversely rippled, more scaly in frontal half; setae of normal length, slightly raised, punctures very small, widely apart, numerous. Scutellum 1.27 times as long as broad, rounded at base, sculptured as mesoscutum, setae on hinder one-third longer and more raised, punctures as on mesoscutum; flange very narrow, indistinctly trabeculate. Dorsellum very weakly alutaceous. Propodeum very finely delicately alutaceous slightly weaker medially, frontally with a row of very small fovea. Mesepimeron 1.6 times as high as broad, 0.7 times as long as mid coxa. Hind leg with coxa twice as long as broad, strongly curved, hairy on basal half dorsally; femur 4.1 times as long as broad; spur of tibia 1.28 times as long as breadth of tibia and 0.47 length of basitarsus. Forewing 2.7 times as long as broad; costal cell 11 times as long as broad, upper surface with one row of hairs in distal half, below with one row plus scattered hairs except in the middle; basal cell with six hairs in upper half, closed below; basal vein with six setae; speculum extending somewhat beyond parastigma, nearly closed. M:PM:ST=61:18:6.5, ST very shortly petiolate, nearly vertical.

Gaster slightly compressed; hypopygium extending nearly two-third along gaster, bare. Ovipositor sheaths slightly longer than gaster, index 1.7-1.9. Length 2.3-3.0 mm.

Colour: body blue-green. Palpi testaceous. Antennae black, scape testaceous beneath. Coxae, and hind femora except bases and tips, colour of body; fore and mid femora proximally, and hind tibiae medially, infuscate; rest of legs testaceous, fifth larval segment brown. Scapulae testaceous. Wings hyaline, venation testaceous.

Male.— Unknown.

Comments.— Morphologically, *T. scandicus* somewhat resembles the female of *T. rosariae* spec. nov., which differs in having the temples shorter (0.25-0.28 length of eyes), malar space slightly shorter, anellus subquadrate, flagellum weakly clavate, hind femora slightly stouter (3.6-3.8 times as long as broad).

Biology.— Unknown.

Distribution.— Sweden.

*Torymus scaposus* (Thomson, 1876)  
(fig. 204)

*Callimomus scaposus* Thomson, 1876: 77-78, ♂ ♀; Hoffmeyer, 1930c: 235; Nikol'skaya, 1952: 114; Erdős, 1960: 7; Boucek, 1954: 62; Nikol'skaya & Zerova, 1978: 368; Sellenschlo & Wall, 1984: 19; Hansson, 1991: 10; Grissell, 1995: 287.

Type material.— **Lectotype** of *Callimomus scaposus* ♀ (ZIL), selected by Graham, validated by Hansen (1991: 10); labels "Kgsm 1/7" [in Thomson's hand]; "scaposus Ths".

Biology.— Unknown, found in marshy places, possibly associated with *Carex* like other species in the group.

Distribution.— Czech Republic, Hungary, Netherlands, Sweden. Much more local and rare than *T. laetus* (although possibly widespread).

*Torymus schizothecae* Ruschka, 1921  
(fig. 205)

*Torymus schizothecae* Ruschka, 1921: 341, ♀; Sellenschlo & Wall, 1984: 28; Grissell, 1995: 287.

*Callimome schizothecae* (Ruschka) Hoffmeyer, 1930c: 242.

Type material.— Three females, gummed to card-points and staged on separate mounts; labels (on all mounts) “*Steffaniella* spec. *Schizotheca patula* Kg. Weinbge Boh., Baudys 2653”, “*Schizothecae* m. det. Ruschka”. The specimens are conspecific one is here designated **lectotype**, the other two are here designated **paralectotypes** (NHMW). They are so labelled.

Comments.— The host plant (*Schizotheca patula*) is now known as *Atriplex patula* L. (Chenopodiaceae).

Biology.— Reared from galls of *Steffaniella* spec.

Distribution.— Austria.

*Torymus scutellaris* (Walker, 1833)  
(fig. 206)

*Callimome scutellaris* Walker, 1833: 123, ♀.

*Torymus scutellaris*; Boucek & Graham, 1978a: 227; Grissell, 1995: 287.

*Torymus auronitens* Foerster, 1840: xxx, ♀. **Syn. nov.**

*Torymus pleuralis* Thomson, 1876: 89-90, ♀; Sellenschlo & Wall, 1984: 27.

*Callimome pleuralis*; Hoffmeyer, 1930c: 240.

Type material.— *Callimome scutellaris* Walker. **Neotype**, ♀, (BMNH), here designated, “England: Middlesex, Southgate (2) 22.8.1967, M. de V. Graham, swept from foliage of *Quercus robur*”.

*Torymus auronitens* Foerster, **lectotype**, ♀, (NHMW), here designated, labelled “*Torymus auronitens* nob. det. Förster”. **Paralectotype**: ♀ (NHMW): here designated, is labelled “Först; Aachen coll. G. Mayr; *Tor. auronitens* Förster, Type; *Torymus auronitens* Foerster Aachen” [in Foerster’s hand].

*Torymus pleuralis* Thomson: **lectotype** (possibly holotype), ♀, (ZIL type number 1543: 1), selected by Graham, validated by Hansson (1991: 11).

Comments.— Eady (1959: 262) found no material in BMNH. Walker (1846: 16) incorrectly synonymised *scutellaris* with *amoenus* Boheman and Mayr (1874: 117) followed this. Boucek & Graham (1978:72) placed *T. pleuralis* Boheman [recte Thomson] in synonymy with *scutellaris*. From the description it appears that Walker might have had only one female specimen.

Biology.— Unknown.

Distribution.— Britain, France, Germany, Moldova, Netherlands, Sweden.

*Torymus seminum* (Hoffmeyer, 1929)  
(figs 207-208, 265)

*Callimome seminum* Hoffmeyer, 1929: 332, ♀; 1930c: 236.

*Torymus seminum*; Boucek, 1977: 26; Grissell, 1995: 287.

*Syntomaspis seminum*; Sellenschlo & Wall, 1984: 21.

Type material.— **Holotype**, ♀, (ZMK): “Rafnesøn vii-1928; Italien; Samen *aceris campestris*; Type [red ink on white label]; *Syntomaspis seminum* Hffmr.; Type [red label]; *Syntomaspis seminum* n. sp. Hoffmeyer 1928”. **Paratypes**: 4 ♀♀ (ZMK): “Rafnesøn vii-1928; Italien sem. *aceris campestris*; coll. Eric B. Hoffmeyer; *Syntomaspis seminum* n. sp.” [label in pencil].

Comments.— Hoffmeyer (1929: 332) stated: “Das Typenexemplar, auf einer Kartonspitze, in meiner Sammlung. Paratypen in Zool. Mus. Kopenhagen”. He had seven females which he found in a window at Skovrøkontoret, amongst various insects which had emerged from seeds of *Acer campestre* imported from southern Europe. Only six of the original series have been found; three other females, labelled “Italien 1929 Rafn; *Acer camp. semen*” are not accepted as syntypes. The syntypes do not have an offset frenum, although Hoffmeyer (1930c: 236) placed the species in the section *Syntomaspis*.

Biology.— Possibly reared from seeds of *Acer campestre*.

Distribution.— Italy, Macedonia.

*Torymus socius* Mayr, 1874  
(figs 209-211)

*Torymus socius* Mayr, 1874: 126, ♂ ♀; Boucek, 1977: 27; Grissell, 1995: 287.  
*Callimome socium*; Hoffmeyer, 1930c: 242.

Type material.— **Lectotype**, ♀, (NHMW): here designated, labelled “Pimp. Waidhofen”; “*Tor. socius* Mayr det. G. Mayr”. **Paralectotypes**: (NHMW): 4 ♀♀ on three mount one ♂ and a ♀ on one pitch block (female gaster broken off) and one ♂ all selected and labelled as lectotype resp. paratype by Boucek.

Biology.— Reared from galls of *Kiefferia pimpinellae* (Dipt. Cecidomyiidae) on various Umbelliferae.

Distribution.— Austria, France, Slovenia.

*Torymus spaici* Boucek, 1994  
(fig. 212)

*Torymus spaici* Boucek, 1994: 85-86, ♀; Grissell, 1995: 287.

Type material.— **Holotype**, ♀, (BMNH): Croatia: Gorski Kotar, Zalesina, 25.vi.1965 (Boucek)

Biology.— Unknown.

Distribution.— Croatia.

*Torymus speciosus* Boheman, 1834  
(figs 213-214)

*Torymus speciosus* Boheman, 1834: 349-350, ♀; Mayr, 1874: 107-108, in part; Thomson, 1876: 82, 89 (note); Györfi, 1962: 209; Boucek, 1977: 27; Grissell, 1995: 287.

*Torymus pallitarsis* Foerster, 1840: xxix, ♀; Grissell, 1995: 285. **Syn.n.**

*Callimome speciosus*; Hoffmeyer, 1930c: 236.

[*Torymus hederæ*; Nikol'skaya & Zerova, 1978: 370; Sellenschlo & Wall 1984: 25, misidentification].

Type material.— **Holotype**, ♀, (ZIL): on a tiny yellow ticket; “12” on a white ticket; “*T. speciosus* ♀ Bohem. n. sp. a Boh. det.” [in Zetterstedt's hand].

*Torymus pallitarsis* Foerster: original material appears to be lost.

Comments.— Boheman described *speciosus* from a single female (“specimen, in

Scania ad Abusa lectum, a Celeb. Dom. ZETTERSTEDT benevole communicatum"). In 1973 Graham studied the holotype female in the Zetterstedt collection (ZIL). It is pinned and lacks the gaster. Graham labelled the specimen as holotype.

Thomson saw the holotype and correctly interpreted the species. Mayr (1874) had a mixed series under this name. The female which he referred to (1874: 108) as "Boheman'schen Originalstücke" came from Stockholm and was not the holotype. Thomson (1876: 89) pointed out this error in a Swedish footnote.

*Torymus pallitarsis* Foerster. Only one or two European species agree even reasonably well with the description. Females of *T. speciosus* having more extensively yellow hind coxae fit best.

Biology.— Reared from galls of *Mikiola fagi* (Hartig) (Dipt. Cecidomyiidae) on *Fagus*.

Distribution.— France, Germany, Netherlands, Sweden, Yugoslavia (Croatia).

*Torymus spherocephalus* spec. nov.  
(figs 215-217)

Type material.— **Holotype**, ♀, (RMNH): "France Var M.J. Gijswijt" "Taradeau 5.x.1989".

Description of female.— Head in dorsal view (fig. 215) only about 1.7 times as broad as long, with temples shorter: 0.33 length of eyes; POL 2.25 OOL, OOL 1.15 OD. Face and vertex with alutaceous sculpture, without visible punctures. In frontal view mouth 2.1 times malar space, the latter 0.35 length of eye. Antenna (fig. 217) with F1 shorter and narrower than F2. Pedicellus plus flagellum about 1.3 times breadth of head; pedicellus twice as long as broad, F1 slightly longer than broad, smaller than pedicellus and F1. Mesonotum in frontal part transversely alutaceous, posteriorly more reticulate with isodiametric areoles and very few small punctures. Reticulation of scutellum like that on posterior part of mesonotum. Forewing: costal cell about 9 times as long as broad; stigmal vein (fig. 216) nearly vertical with respect to costa, stigma petiolate. Ovipositor index 3.1, sheaths as long as metasoma plus half mesosoma. Length 1.75 mm.

Colour.— Head and mesosoma blue-green, gaster dark brown with slight green shine in places. Antennae dark brown, scape testaceous ventrally. Coxae coloured as body, fore and mid legs testaceous, mid femora and mid tibiae slightly darkened, hind femora and tibiae brown, hind femora with a greenish tinge.

Male.— Unknown.

Comments.— Differs from that of *crassiceps* spec. nov. by the longer ovipositor and by the smaller F1.

Biology.— Unknown.

Distribution.— France.

*Torymus spilopterus* Boheman, 1834  
(figs 218-219)

*Torymus spilopterus* Boheman, 1834:364-365, ♀; Boucek & Graham, 1978a: 227; Boucek, 1994; Grissell, 1995: 287.

Type material.— Two specimens stand in the Boheman collection one of which is from the type locality. It is labelled “V.G.; Bhn; TYPE [on a white label]; Thoms.”, and is here designated **lectotype**.

Biology.— *Thecodiplosis brachyntera* (Schwägrichen) (Dipt. Cecidomyiidae), on Pinus.

Distribution.— Czech Republic, Great Britain, Italy, Sweden.

*Torymus stenus* Graham, 1994  
(fig. 220)

*Torymus stenus* Graham, 1994a: 25-26, ♂ ♀; Grissell, 1995: 288.

Type material.— **Holotype**, ♀, (BMNH): “England, Lincolnshire, Woodhall Spa, 27.vii.1968 (Graham)”. **Paratypes**: (BMNH, ZB): 3 ♀ ♀, same data as holotype; 2 ♂ ♂, 1 ♀, “Lincolnshire, Coningsby, 27.vii.1951”. Czech Republic: 2 ♂ ♂, 2 ♀ ♀ “Bohemia, Decin district, Maxicky, 8.vii.1956”, 4 ♀ ♀, “Bela, 14.vi.1957”, 2 ♀ ♀, “Deblik and Trabice hills, 15.vi.1957 and 28.vi.1957”, 1 ♀ “Radotin-Sulava near Prague, vii.1963 (Macek)”; 1 ♀ “Velky Vrestov, 13.viii.1959”, 1 ♀ “Novy Hradec Kralove, 19.vii.1955”, 2 ♀ ♀, “Tyniste nad Orlici, 5.vii.1959”, 1 ♀ “12.viii.1959, 2 ♀ ♀ 20.viii.1959” (all Boucek); 1 ♀, “Moravia, Lednice, 17.vii.1962, J. Strejcek”. Slovakia: 1 ♀, “Slovensky Raj, Tomasov Vyhlad, near Cingov, 28.vii.1965, Graham”.

Biology.— Reared from a host on *Deschampsia flexuosa* (Gramineae) by W.C. Nijveldt.).

Distribution.— Czech Republic, Great Britain, Netherlands, Slovakia.

*Torymus tanaceticola* Ruschka, 1921  
(fig. 221)

*Torymus tanaceticola* Ruschka, 1921: 339, ♂ ♀; Sellenschlo & Wall, 1984: 28; Grissell, 1995: 288.  
*Callimome tanaceticola*; Hoffmeyer, 1930c: 240.

Type material.— **Lectotype**, ♀, (NHMW, previously in Forstinstitut), here designated. Labels: “Silesia Karlstal 1906 Wachtl; 30; *Torymus tanaceticola* Ruschka Type”.

Comments.— In NHMW there are more than 20 specimens, males and females, on pith blocks and on a card. Moreover there is one female in BMNH. All are labelled “*Rhop. tanaceticola* K. Liebenau 2703 Boh., Baudys. *T. tanaceticola* R.”. Liebenau is not the original locality, therefore the specimens from this series cannot be regarded as syntypes.

Biology.— Reared from galls of *Rhopalomyia tanaceticola* Karsch (Dipt. Cecidomyiidae) on *Tanacetum*.

Distribution.— Czech Republic, Germany, Netherlands, Poland.

*Torymus thymi* Ruschka, 1921  
(figs 222-224)

*Torymus thymi* Ruschka, 1921: 339, ♂ ♀; Sellenschlo & Wall, 1984: 28; Grissell, 1995: 288.  
? *Callimome thymi*; Hoffmeyer, 1930c: 241, 251.

Type material.— **Lectotype**, ♀, (NHMW): here designated, labelled “*Asph. thymi* Kff. Prag-2679 Boh.,

Baudys"; "*Tor. thymi* Ruschka det. Ruschka"; "Type" (red label); "in coll Vienna Museum as *Torymus thymi* Ruschka. nr. 355". (This mount also carries a ♂). **Paralectotypes**: 2 ♂♂ and 1 ♀ (NHMW), on two pins (one male mounted on one pin with lectotype), labelled as lectotype; 1 ♀ (NHMW) labelled "*Asph. menthae* Pierre on *Mentha aquatica* U. Eisenstadt 2710, Boh. Baudys"; 1 ♀ (BMNH) labelled "*Asph. thymi* Kff. Prag 2679 Boh., Baudys; *Tor. thymi* R. det. Ruschka".

Comments.— Hoffmeyer (1930c: 251) noticed that he was not sure of the identity of his species. The authors have not seen this material.

Biology.— Reared from galls of *Janetiella thymi* Kieffer and *Asphondylia menthae* Pierre on *Thymus* and *Mentha* respectively.

Distribution.— Czech Republic, ? Denmark.

### *Torymus tipulariarum* Zetterstedt, 1838

[*Torymus viridissimus* var. b. Boheman, 1833: 358-359]

*Torymus tipulariarum* Zetterstedt, 1838: 420, ♂ ♀; Mayr, 1874: 111-112, in part; Thomson, 1876: 95.

? *Callimome tipulariarum*; Hoffmeyer, 1930c: 241.

Type material.— **Lectotype** of *T. tipulariarum* ♀ (ZIL), here designated, mounted with a ♂ on one pin; labelled [in Zetterstedt's hand] "var. b. ♂ ♀"; also "*Torymus tipulariarum* Zett. Type. Ch. Ferrière det". **Paratypes** of *tipulariarum*: the ♂ mounted with the lectotype and a ♂ and a ♀ (ZIL) mounted on a pin, with a white pupa-case of a Cecidomyiid fly below, labelled "e tubercul. ramulor *Salix* 26 May 1819".

Comments.— Zetterstedt's description includes the words "Lapponia rariss— Ostrogothia; Gottlandia, Scania, freq. e pupis Tipulorum in tuberculis ramulorum Salicis, tempore vernali, saepe egressus".

Thomson correctly interpreted this species; he would have seen the syntypes. Mayr (1874) however, has a mixed series under the name. It is also doubtful whether Hoffmeyer had a clear idea of its identity. The present diagnosis is taken from specimens compared with the lectotype and checked against notes which were taken in 1959 at the time the types have been seen.

Several specimens in MJG are regarded as a form of *T. tipulariarum* Zetterstedt. Reared from the same host species they have shorter ovipositors (o.i. 1.5-1.7), but cannot be distinguished in other respects from the typical form (see key to females couplet 67).

Biology.— Reared from galls of *Rabdophaga salicis* on *Salix*.

Distribution.— France, Britain, Netherlands, Sweden.

### *Torymus triangularis* Thomson, 1876 (figs 225-227)

*Torymus triangularis* Thomson, 1876: 96, ♀; Graham, 1969: 67; Sellenschlo & Wall 1984: 28 in part; Hansson, 1991: 11; Grissell, 1995: 288

*Callimome triangulare*; Hoffmeyer, 1930c: 244.

Type material.— **Lectotype**, ♀, (ZIL): "Gl [Gotland]; Bhn [Boheman]; triangularis Thoms."; ZIL Type no. 1545: 1, selected by Graham, validated by Hansson (1991: 11). **Paralectotype**: here designated: 1 ♀ (NR), "Gl; Bhn; TYPE [on white label, probably added by Thomson] triangulare," [in pencil, Thomson's hand].

Redescription of female.— Morphology: head in dorsal view (fig. 225) twice as broad as long; temples 0.12 apparent length of eyes, converging strongly, slightly curved. POL 1.85 OOL, OOL 1.3 OD. Eyes hardly 1.3 times as long as broad, separated by hardly their own length, with very short pilosity. Vertex with fine reticulation and scattered, very small punctures. Head in front view trapeziform, genae straight. Mouth about twice malar space, the latter 0.33 length of eye. Clypeus convex, its anterior margin hardly produced, with a strong seam along its front edge. Mandibles with 3 sharp teeth. Antenna (fig. 227): scape about 4.5 times as long as broad, its length slightly greater than breadth of eye, reaching to level of middle of anterior ocellus; pedicellus plus flagellum 1.33 breadth of head; pedicellus twice as long as broad, hardly longer than F1; anellus quadrate; F1 1.4-1.5 times as long as broad, slightly narrowed towards its base, which is hardly broader than the anellus, following segments slightly longer than broad, except F6 which is subquadrate, and F7 which is quadrate or very slightly transverse; clava 2.5 times as long as broad, about as long as F7+F6+ half of F5; funicle without areas of micropilosity beneath; clava with only a small tuft on C3; sensilla numerous, uniseriate or partly biseriate, extending over the distal two-thirds of each segment.

Mesosoma 1.65 times as long as broad, only moderately arched dorsally. Propodeum sloping at 35 degrees. Mesoscutum about 1.5 times as broad as long, rather dull, with fine, pappiliform reticulation; piliferous punctures rather small, separated by about 1.5 times their diameter. Scutellum 1.25 times as long as broad, rather dull, with relatively broad, subtruncate base, with reticulation like that of mesoscutum, piliferous punctures moderate-sized, about 1.5 their diameter apart, setae distinctly raised, those of posterior part slightly longer than the anterior ones, flange rather narrow, with distinct trabeculae. Dorsellum nearly smooth, with trace of median longitudinal sulcus. Propodeum moderately shiny, with delicate superficial strigulose-alutaceous sculpture and a row of small foveae along the base; spiracles rather small, 1.5 times as long as broad, about 0.25 their length from metanotum and about twice their length from posterior margin. Mesepimeron nearly as high as mid coxa, 1.1 times as high as broad, nearly square. Hind coxa 2.5 times as long as broad, its hind margin moderately curved, without any trace of dorsal carina, with rather fine reticulation which is slightly raised over proximal half, otherwise engraved, dorsal surface bare in basal half. Fore femur 4 times, hind femur 3.7 times, as long as broad. Longer spur of hind tibia 0.47 length of basitarsus. Forewing 2.6 times as long as broad; costal cell 10 times as long as broad, upper surface bare except for 5 setae in distal third, lower surface with one complete row plus scattered setae in proximal 0.2 and distal 0.25; M:PM:ST=80:15:7, stigma small, subcircular, with moderate long uncus; basal cell bare, closed below except at base; basal vein with 4 setae; speculum moderate-sized, closed below except in basal third, extending slightly beyond the parastigma, thence continued as a very narrow strip to ST; wing just below M sparsely setose, elsewhere moderately thickly.

Gaster (fig. 226) somewhat compressed; basal sternite extending beyond hind coxa by nearly half the length of the latter; hypopygium bare except for 3-4 setae at tip which is nearly level with apex of gaster; tergites 1-3 with posterior margin distinctly excised, tergite 4 with a small triangular excision, from which a weakly sclerotized line extends basad for a short distance. Ovipositor index about 2.0, sheaths

about as long as metasoma plus one third of mesosoma. Length about 3 mm.

Colour: head violet with face partly blue-green or blue. Antennae black; scape testaceous, sometimes infusate dorsally over distal part. Palpi yellowish

Mesosoma blue-green to greenish-blue; axillae more or less, sometimes the pronotum and side-lobes of mesoscutum posteriorly, violet-tinged. Mid and hind coxae coloured like mesosoma, legs otherwise, except base of fore coxae in one female, yellowish-testaceous with tarsi paler, the latter brownish at tips. Tegulae testaceous. Wings hyaline, venation yellowish.

Gaster blue-green, with violet tint over at least posterior half of each of tergites 2-5.

Male.— Unknown.

Comments.— The female of this species is redescribed because it has not clearly been understood. It most resembles *T. grahami* Boucek, 1994, which differs as follows.— Tip of hypopygium less near apex of gaster (at about 0.75 its length); antennal flagellum less slender, with anellus more or less transverse, funicular segments slightly shorter, also the clava; POL:OOL ratio slightly greater; mesoscutum and scutellum more shiny, with smaller punctures, sides of scutellum converging more strongly to form a narrower, rounded base.

Biology.— Unknown.

Distribution.— Sweden (Island of Gotland).

*Torymus ulmariae* Ruschka, 1921  
(fig. 228)

*Torymus ulmariae* Ruschka, 1921: 340, ♂ ♀; Sellenschlo & Wall, 1984: 28; Grissell, 1995: 289.  
*Callimome ulmariae*; Hoffmeyer, 1930c: 245.

Type material.— Two females and one male on minutien pins, stayed on a pith block in NHMW. **Lectotype**, here designated, the larger of the two females, on the right hand of the male; labels "*Cec. ulmariae* Weidling coll. Wachtl"; "*T. ulmariae* Ruschka, Type"; "Type" (red label).

Biology.— Reared from *Dasineura ulmariae* (Bremi) on *Filipendula*.

Distribution.— Austria.

*Torymus valerii* spec. nov.

Type material.— **Holotype**, ♀, (RMNH): "España prov. Jaén M.J. Gijswijt, Sta ELENA, /galls *Rhopalomyia valerii* (Houard nr 135) 6.vi.1992". **Paratypes**: (MJG, BMNH, ZMA): 1 ♀ topotypic, 1 ♂, same data but 12.vii.1992, 1 ♀ same data but 15.vii.1992", 2 ♂ ♂ same data but 26.v.1992, 2 ♀ ♀, Espana, prov. Murcia M.J. Gijswijt, Sa de Espuna /galls *Rhopalomyia valerii* (Houard nr 155) 1.vi.1992"; 2 ♂ ♂, 3 ♀ ♀ Espana prov. Jaén, Sta Elena 900 m, on *Juniperus oxycedrus* 28.v.1992", 32 ♀ ♀, 6 ♂ ♂ same data but 1.vi.1992; 1 ♀ prov. Madrid M.J. Gijswijt, Manzanares on *Juniperus oxyc.* 15.vi.1990".

Description of female.— Morphology: head in dorsal view about twice as broad as long, temples 0.26 apparent length of eyes, moderately converging, curved (as in *chloromerus*); POL 1.9-2.1 OOL, OOL 1.1-1.15 OD, vertex finely sculptured with scattered small punctures. In frontal view mouth 2.0-2.1 malar space, malar space 0.35-0.37 length of eye; head subtrapeziform, with very slightly curved genae. Clypeus hardly produced, very broadly truncate. Antennae with toruli well above lower eye-



line, but slightly nearer to clypeus than to anterior ocellus; scape 3.4 times as long as broad, nearly or just reaching lower edge of anterior ocellus; pedicellus plus flagellum 1.28-1.37 breadth of head, flagellum proximally slightly stouter than pedicellus, weakly clavate; pedicellus twice as long as broad; anellus very slightly transverse; F1 slightly longer than broad, following segments quadrate or F7, very slightly transverse; in smallest females all segments are quadrate to F5-F7 which are very slightly transverse; clava 1.7-2.1 times as long as broad; sensilla numerous, uniseriate.

Mesosoma 1.9 times as long as broad, finely reticulate, slightly rippled in front half or third. Mesonotum 1.3 times as broad as long, punctures numerous but minute, setae rather short, slightly raised. Scutellum 1.35 times as long as broad, sculpture as in mesonotum, setae on hind third long and distinctly raised; flange very narrow, indistinctly trabeculate. Dorsellum nearly smooth. Propodeum very finely alutaceous, smoother medially. Mesepimeron 1.4 times as high as broad, shorter than length of mid coxa (16:22). Hind leg with coxa 2.6 times as long as broad, hairy on dorsal edge, moderately curved, with finely, slightly raised sculpture; femur 4.2 times as long as broad; spur of tibia 0.46 length of basitarsus. Forewing 2.45 times as long as broad; costal cell 9 times as long as broad, above with 1 row of setae either in distal half only or complete, below with one complete row plus scattered setae except in the middle; basal cell with 3-5 setae below SM, closed in distal half to third or wholly; basal vein with 3-5 setae; speculum moderately large, extending to slightly beyond parastigma, partly open. M:PM:ST=63:14:6, stigma subsessile.

Gaster hardly or slightly compressed; basal sternite extends beyond coxa by about one-third length of coxa; hypopygium extending about three quarters along gaster, bare except tip. Ovipositor index 2.7-3.1. Length 2.0-2.6 mm.

Colour: body bright green to blue-green. Antennae black, scape testaceous, more or less dark dorsally. Coxae as body, or fore coxae more or less yellow; rest testaceous, most often hind femora broadly infusate, slightly metallic, mid femora sometimes dark striped below; hind tibiae more or less infusate medially, fore tarsi brown, mid and hind tarsal segments 5 fuscous, 4 slightly brownish. Tegulae mainly yellow. Wings hyaline, venation testaceous.

Description of male.— Differs from female as follows:

Antennal scape blue-black, not reaching anterior ocellus, slightly curved, shiny though minutely reticulate externally; pedicellus plus flagellum 1.4 times breadth of head, flagellum distinctly stouter than pedicellus; pedicellus hardly longer than broad, about as long as F1; proximal funicle segments quadrate, F6 and F7 slightly transverse, flagellum thickly clothed with short, curved black setae. Fore and mid femora somewhat broadly infusate; hind tibiae more broadly infusate.

Comments.— The female is very close to that of *artemisiae* Mayr but differs in having POL:OOL ratio slightly greater, ped. + flag: head greater, host different on different plants.

Biology.— Reared from galls of *Rhopalomyia valerii* Tavares (Dipt. Cecidomyiidae) on *Juniperus oxycedrus*.

Distribution.— Spain.

*Torymus varians* (Walker, 1833)  
(figs 229-232, 266)

*Callimome varians* Walker, 1833: 122, ♀.  
*Syntomaspis varians*; Eady, 1959: 260, in part; Graham, 1969: 69, in part; Boucek, 1977: 27; Sellenschlo & Wall 1984: 21, in part.  
*Torymus varians*; Burks, 1967: 250; Boucek, 1988: 145; Grissell, 1995: 289.  
*Torymus pubescens* Foerster, 1840: xxx, ♀.  
*Syntomaspis pubescens*; Mayr, 1874: 77-78.  
*Syntomaspis annellus* Thomson, 1876: 76, ♀; Sellenschlo & Wall, 1984: 20.

Type material.— *Callimome varians* Walker: **lectotype**, ♀, (BMNH): designated by Eady (1959: 260) who incorrectly synonymised *druparum* Boheman with it.  
*Torymus pubescens* Foerster: no original material found.  
*Syntomaspis annellus* Thomson: **holotype**, ♀, (ZIL type no, 1536:1): (Hansson, 1991: 10), labelled: "Hbg"; and "annellus m." in Thomson's hand. Placed in synonymy with *varians* (Walker) by Graham (1969: 69).

Comments.— *Callimome varians* Walker: Walker's original material was taken "near London" [Southgate, where it was common when Graham collected there some years ago].

*Syntomaspis annellus* Thomson is placed in synonymy with *T. varians* (Walker) by Graham (1969: 69).

*Torymus pubescens* Foerster: Mayr (1874: 78) discussed the question of its identity; his redescription suggests that he had specimens of *varians* before him. Eady (1959: 260) accepted his conclusion.

Biology.— This species is phytophagous in the seeds of *Crataegus*.

Distribution.— Britain, France, Germany, Netherlands, Yugoslavia (Croatia).

Variation.— Varies considerably in size and colour: the body is sometimes green but more often partly or mainly brassy to coppery.

*Torymus ventralis* (Fonscolombe, 1832)  
(fig. 233)

*Cinips ventralis* Fonscolombe, 1832: 286, ♀.  
*Torymus ventralis*; Mayr, 1874: 93-94; Boucek, 1977: 27; Nikol'skaya & Zerova, 1978: 370; Nilsson, 1979: 540; Sellenschlo & Wall, 1984: 28; Grissell, 1995: 289.  
*Callimome ventrale*; Hoffmeyer, 1930c: 237.  
*Callimomus ventralis*; Nikol'skaya & Zerova, 1978: 368.  
*Callimome quadricolor* Walker, 1833: 120, ♀.  
*Callimome antennatus* Walker, 1833: 135, ♂.  
*Callimome versicolor* Walker, 1833: 136, ♂.  
*Callimome confusus* Walker, 1834: 161, ♂. **Syn. nov.**  
*Torymus confusus*; Grissell, 1995: 278.  
*Callimome rudis* Walker, 1836: 25, ♀.  
*Torymus affinis* Foerster, 1840: xxix, ♀.  
*Torymus modestus* Foerster, 1840: xxx, ♂; Grissell, 1995: 284. **Syn. nov.**  
*Torymus obscuripes* Foerster, 1840: xxx, "♀" [recte ♂]; Grissell, 1995: 285. **Syn. nov.**  
*Callimomus discolor* Thomson, 1876: 79, ♂ ♀; Hoffmeyer, 1930c: 235.

Type material.— *Cinips ventralis* Fonscolombe: **neotype**: ♀, (BMNH), designated by Graham (1992: 1099).

*Callimome quadricolor* Walker, *C. antennatus* Walker, *C. versicolor* Walker, and *C. rudis* Walker: **lecto-**

**types** designated by Eady (1959: 259), who placed them in synonymy with *ventralis*.

*Callimome confusus* Walker: the original material appears to be lost (Eady, 1959: 269).

*Torymus affinis* Foerster: no original material found.

*Torymus modestus* Foerster: **lectotype**, ♂, (NHMW): here designated, it bears a tiny green square label "Collect. G. Mayr; Meg. [sic] modestus Förster, Type; *Torymus modestus* Förster, Type".

*Torymus obscuripes* Foerster: **lectotype**, ♂, (NHMW): here designated, the right-hand specimen of two mounted on the same pith block, having one complete antenna [the left-hand ♂ lacks flagella]. "Bos-sess; Collect. G. Mayr; Meg. [sic] obscuripes Förster, Type"; "*Torymus obscuripes* Förster, Type". Paralec-totypes: the remaining specimens.

*Callimome discolor* Thomson: **lectotype**, ♂, (ZIL), selected by Graham, validated by Hansson (1991: 10), Eady (1959: 259) synonymised *C. discolor* with *T. ventralis*.

Comments.— *Cinips ventralis* Fonscolombe: original material destroyed.

*Callimome confusus* Walker: "Taken near Paris by M.F. de Laporte". The unusual combination of characters given in the description agrees very well with some small males of *ventralis*, and with males of no other species.

*Torymus affinis* Foerster: synonymised with *T. quadricolor* Walker [= *ventralis*] by Walker (1846: 15). His conclusion appears correct and we accept it.

*Torymus modestus* Foerster: one male stands under this name in NHMW. Its gaster has a rather obscure reddish band near the base (not mentioned in the description; may be in part due to fading). Otherwise it agrees with the description. It represents a large, pale-legged form of *ventralis*.

*Torymus obscuripes* Foerster: the description refers only to the female sex, but mentions no ovipositor. Under this name in NHMW there are 11 males. We consider these to be syntypes and the sign "♀" in the description was an error for "♂". All represent extreme dwarfs of *T. ventralis*, in which the propodeal sculpture is very weak (aluta-ceous).

Biology.— Reared from galls of *Proshormomyia fischeri* Frauenfeld (Dipt. Cecidom-yiidae) on *Carex*.

Distribution.— Widespread in Europe.

*Torymus verbasci* Ruschka, 1921  
(fig. 234-235)

? *Misocampus nigricornis* Dufour, 1846: 17-18, ♂ ♀.

*Torymus verbasci* Ruschka, 1921: 339-340, ♂ ♀; Sellenschlo & Wall, 1984: 29; Grissell, 1995: 289.

*Callimome verbasci*; Hoffmeyer, 1930c: 245.

Type material.— *Misocampus nigricornis*: no type material seen. See for details under comments.

*Torymus verbasci*: syntypes, 9 ♂♂, 10 ♀♀ in NHMW; 1 ♀ in BMNH. The specimens in NHMW are on 19 separate mounts. A ♀, here designated **lectotype** is labelled "*Asph. verbasci* St. Georgen b. Press-burg" [Bratislava]; "*verbasci* n. sp. det. Ruschka". The other specimens are designated **paralectotypes**, as the female specimen in BMNH, which is labelled "/12/79; *Asph. verbasci*; *T. verbasci* R."

Comments.— In Forstinstitut, Vienna (coll. Wachtl) there are further specimens as follows. (1) one pith block with one male and 4 females (2 damaged), labelled "Brühl 6.8.81 Handlir; 14; *Torymus verbasci* Ruschka. 21".

(2) A pith block with 2 females and a male Tetrastichine; labelled "Brühl 8.8.81 Handlir.; 17; *Torymus verbasci* 2 ♀. *Tetrastichus* sp. 1 ♂. det. Ruschka 21."

(3) A pith block with three females and a male Tetrastichine; labelled "Brühl

9.8.81 Handlir 16; *Tor. verbasci* 3 ♀ *Tetrastichus* sp. 1 ♀ [recte ♂] det. Ruschka 21".

(4) A female remounted and labelled by Dr. Boucek: Austria, Brühl, 6.8.1881. Handlirsch. Ex *Asphond. verbasci*; ♀ ST *Torymus verbasci* Ruschka det Boucek, 1978". All the above specimens were reared by Handlirsch (not mentioned by Ruschka) and differ from the lectotype in having shorter ovipositor. They cannot therefore be syntypes.

These specimens might be *Misocampus nigricornis* Dufour. Ruschka (1921: 340) noted that *M. nigricornis* was a synonym of his *verbasci*. This seems incorrect, because Dufour described the ovipositor of *nigricornis* as equal in length of the gaster, whereas in *verbasci* it is considerably larger. The above Forstinstitut specimens from Brühl have the ovipositor only slightly longer than the gaster, index 1.9-2.25, and may therefore referable to *nigricornis* (Dufour). In 1962 Graham saw two boxes of Dufour material including *Misocampus*, in MNHN, but did not examine them closely.

Biology.— Reared from *Asphodylia verbasci* Vallot. (Dipt. Cecidomyiidae).

Distribution.— Austria.

#### *Torymus veronicae* Ruschka, 1921

*Torymus veronicae* Ruschka, 1921: 338-339, ♀; Sellenschlo & Wall, 1984: 29; Grissell, 1996: 289. *Callimome veronicae*; Hoffmeyer, 1930: 241.

Type material.— Described from 2 females reared by Wachtl from *Perrisia veronicae* Vallot. This material has not been located.

Comments.— The characters used in the key are from the original description and from recently reared material.

Biology.— Reared from galls of *Jaapiella veronicae* (Vallot) on *Veronica*.

Distribution.— Austria, Great Britain.

#### *Torymus wachtiellae* spec. nov. (figs 237-238)

Type material.— **Holotype**, ♀, (RMNH): Netherlands, "Cuyk (L.) 17.ix.1973 H.J. Vlug, *Wachtiella ros.* Depot 73 coll. 17.viii.1973". **Paratypes**: 5 ♀ ♀ (RRA) France "ex *Wachtiella rosarum*. Rosa. Bernac Lot et Gar. Fr. 7-8 1993. RRA" [R.R. Askew]; 1 ♀ (MJG), "France Dépt. Gard, Crespian 22.vi.1982, / *Wachtl. rosarum*"; 1 ♀ (MJG), "France Drôme M.J. Gijswijt, Aubres 16-27 ix 1985 on *Hedera*"; 1 ♀ (MJG), "France-84 Mazan 12-20.ix.1993 M.J. Gijswijt"; 1 ♀ (MJG), "France-84, Mt. Ventoux (Combe Brune), 30.viii.1996, M.J. Gijswijt".

Female.— Differs from that of *partitus* as follows:

Morphology: scutellum (fig. 238) with more numerous piliferous punctures, distributed over the whole surface and leaving no impunctate band down the middle. ST distinctly petiolate. Malar space 0.32-0.35 length of eye. Length of holotype 3 mm.

Colour: body bright golden-green to green. Pleuron of mesosoma plus sides of gaster usually more or less brassy or coppery. Antennae scape black, testaceous beneath or testaceous with dorsal edge black. Mid and hind coxae, and occasionally basal third or half of fore coxae, as body. Rest yellowish-testaceous; hind femora sometimes with faint metallic flush externally, occasionally hind tibia slightly infus-

cate medially; fifth tarsal segment brown, fourth slightly brownish. Tegulae yellowish. Wings hyaline, venation testaceous.

Male.— Unknown.

Biology.— Reared from galls of *Wachtliella rosarum* (Hardy) on *Rosa* spp.

Distribution.— France, Netherlands.

### Species inquirendae

#### *Torymus anastativorus* Fahringer, 1944 (fig. 16)

*Torymus anastativorus* Fahringer, 1944: 580-581, ♀; Boucek, 1977: 24; Grissell, 1995: 275.

The identity is not clear. A female in the Boucek collection may be the species. Its characters are used in the key.

#### *Torymus associatus* Foerster, 1840

*Torymus associatus* Foerster, 1840: xxx, ♂.

Type material not found. The species cannot be identified.

#### *Torymus aurulentus* Nees, 1834

*Torymus aurulentus* Nees, 1834: 416-417, ♀.

*Torymus erucarum*; Dalla Torre, 1898: 311 (evidently a misidentification).

No original material left. Further rearing from the host: a gall on *Rhamnus alaternae* near Aix en Provence can give evidence. However, the only parasite reared by Gijswijt from this host is an undescribed *Aprostocetus*.

#### *Torymus chrysis* (Fabricius, 1793)

*Diplolepis chrysis* Fabricius, 1793: 185, ? ♂; 1804: 150

Original material not traced. The species might be *Torymus auratus* (Müller).

#### *Torymus confluens* Ratzeburg, 1852

*Torymus confluens* Ratzeburg, 1852: 224, ♀; Grissell, 1995: 278.

Original material lost. The species is most probably *T. cultriventris* Ratzeburg.

#### *Torymus contubernalis* Boheman, 1833

*Torymus contubernalis* Boheman, 1833: 362-363, ♀; Grissell, 1996: 279.

In the Boheman collection (NR) stand eight specimens under this name. The series

consists of three species, all disagreeing with the description: one female is a *T. gracilior* Graham, another one is described as *T. crassiceps* in this revision. Three specimens are complete and have the right locality, however, their ovipositors are too short. They therefore cannot be lectotypes. They are small *chloromerus* (Walker).

*Torymus difficilis* Nees, 1834

*Torymus difficilis* Nees, 1834: 61, 418, ♂ ♀.

Original material lost. According to the description it could be *T. flavipes* (Walker).

*Torymus dorycnicola* (Muller, 1870)

*Callimome dorycnicola* Muller, 1870: 77, ♀; Hoffmeyer, 1930: 238; Grissell, 1996: 279.

*Torymus dorycnicola*; Sellenschlo & Wall, 1984: 24.

Type material.— No type material. has been found.

Comments.— The original description is very short; it includes the statement that the antennae are black. Hoffmeyer (1930: 238) included it (based on the description) in the section of his key having antennal scape wholly dark. However, Muller may have overlooked the scape which could have been partly pale. It is not possible to recognise the species at present. The original material was reared from a host on *Dorycnium suffruticosum* at Menton (France, Var), probably *Asphondylia dorycnii* F. Loew (Dipt. Cecidomyiidae), small pubescent galls on the lateral branches.

*Torymus globiceps* (De Geer, 1771)

*Ichneumon globiceps*, De Geer, 1771, vol. 2, part 2: 896-898, pl. 10,11, ♀ only; Villers, 1789:211-212.

*Torymus globiceps*; Nees, 1834: 62-63; Grissell 1995: 282.

Comments.— No type material found. The description and drawing of the female resemble a *Torymus*. Since never a *Torymus* has been reared from the host: galls on *Potentilla recta*.

*Torymus inulae* Wachtl, 1884

*Torymus inulae* Wachtl, 1884: 6-7, ♂ ♀; Sellenschlo & Wall, 1984: 26; Grissell, 1996: 282.

?*Callimome inulae*; Hoffmeyer, 1930: 244.

Type material.— The syntypes (2 ♂♂, 2 ♀♀) of this species have not been located. They were reared from galls of *Diplosis subterranea* Frauenfeld [Dipt. Cecidomyiidae] at the base of stems of *Inula ensifolia*, near Vienna, Austria.

Comments.— According to the description *inulae* might be the same as *T. grahami* Boucek. The most striking characters in the description of the female are: antennal anellus quadrate, half as long as F1 (anellus quadrate in *grahami* and not half as long as F1); F1-F3 longer than broad; ovipositor as long as metasoma plus half to two-

thirds of mesosoma; head and mesosoma, and dorsal surface of gaster mainly, violet; scape reddish-yellow; legs, except base of mid coxae, and hind coxae, reddish-yellow.

In these respects the description would apply to some females of *T. nobilis*; but this always has a reddish subbasal ring on the gaster, which is usually also reddish ventrally.

The characters mentioned may help to identify the species.

*Callimome iridis* Picard, 1930

*Callimome iridis* Picard, 1930: 87-90, ♀; Bernard, 1936: 70.  
*Torymus iridis*; Grissell, 1996: 282.

This species was described as a parasite of *Iris oratoria* L. (Mantodea, Mantidae) from four females in the collection of Abeille de Perrin (MNHN), probably collected in Provence. Bernard (1936: 70) stated that the species had not been seen since but in July 1935 he had obtained a male and a female *Callimome*, together with a male *Iridophaga*, from an old ootheca of *Iris oratoria* which had seemed to be empty. The original material has not been seen.

*Torymus lini* Mayr, 1974

*Torymus lini* Mayr, 1974: 113, ♀.

The species was described from two females (one without head), reared from *Linum usitatissimum*. The type material has not been traced. It is said to be in the Reinhard collection, so it might be in Berlin.

Biology.— Possibly a parasite in a midge gall on common flax.

Distribution.— France.

*Torymus macrurus* (Foerster 1859)

*Syntomaspis macrurus* Foerster, 1859: 101-102, ♀; Erdös, 1960: 10 (note); Sellenschlo & Wall, 1984: 21.  
*Torymus macrura*; Grissell, 1996: 283.

Type material.— Apparently lost.

Comments.— Foerster evidently described the female from a single specimen. He stated "Diese Art lebt in grossen fleischigen Gallen von *Quercus pedunculata*; ich erhielt sie ebenfalls aus dem Kaiserlichen Museo durch Herrn Kollar sur Ansicht; sie stammt aus Ungarn". We could not find any material in Naturhistorisches Museum, Vienna, in 1993. Erdös (1960) mentioned that there was no material in Budapest.

Fresh material reared in Poland and attributed to this species shows that it is very closely related to *cyaneus*.

*Torymus minutus* Foerster, 1840

*Torymus minutus* Foerster, 1840: xxxi, ♀.

Type material not found. The description is too short, the species cannot be identified.

*Torymus resinanae* Ratzeburg, 1852

*Torymus resinanae* Ratzeburg, 1852: 224-225, ♀.

Type material lost.

*Torymus vallisnerii* Cameron, 1901

*Torymus vallisnerii* Cameron, 1901: 273-274, ♀; Grissell, 1996: 289.

*Callimomus vallisnerii*; Hoffmeyer, 1930: 237; Sellenschlo & Wall, 1984: 28 [?invalid emendation].

Type material.— The holotype or syntypes of this species have not been located and its identity remains a mystery.

Comments.— The species was described from material reared from galls of *Nematus gallicola* Westwood [= *Pontania proxima* (Lep.)] (Hym. Tenthredinidae). Amongst the characters mentioned the following are probably the most important: spur of hind tibia hardly one-quarter the length of the basitarsus; ovipositor sheaths about as long as body; head purple, varied with green; gaster dark purple, basal tergite green, venter at base testaceous; flagellum metallic purple; pubescence of mesosoma fuscous.

We have seen no *Torymus* reared from *Pontania proxima*, nor any other species which exactly fit the description. Some small dark specimens of *geranii* (Walker) fit the description of *vallisnerii* very well. Is it possible that Cameron had a mixture of galls and was mistaken regarding the host, and that *vallisnerii* was really the same as *geranii*? For the present, the identity of *vallisnerii* must remain an open question.

*Torymus violae* (Hoffmeyer, 1944)

*Callimome violae* Hoffmeyer, 1944: 158.

*Torymus violae*; Grissell, 1996: 289.

Type material.— Described from several males and females reared from galls of *Dasineura violae* Loew, found 1.viii.1940, at Haslev, Denmark, emerged ix.1940 (Hoffmeyer). Lectotype ♀ (ZMK), here designated, mounted on a slide in Canada balsam with a male. It is labelled: "*Callimome violae* Hoffm. n. sp. ♂ ♀ Typer [underlined in red] ex *Dasyneura violae* F. Lw. leg. ... Haslev 1.8.40 Klakert Sept. 1940 E.B. Hoffmeyer". Our lectotype label is added.

Comments.— We have noted the characters visible in the lectotype female, but owing to its being mounted in balsam, a number of characters are not capable of being measured. Hence an accurate placing of *violae* is not possible, although it is certainly very close to *galii* Boheman. It should be noted that Hoffmeyer's description is incorrect in one respect. He stated that the ovipositor was as long as metasoma plus half mesosoma, the ratio of its length to that of the hind tibia 2.25 (in the lectotype it is about as long metasoma, the ratio only 1.85). The identity of *violae* must remain uncertain until fresh material agreeing with the lectotype can be reared from the orig-



inal host. Specimens reared from *Dasineura violae* in the Netherlands belong to *T. chlo-romerus* (Walker).

### Excluded species

#### *Torymus congener* Foerster, 1840

*Torymus congener* Foerster, 1840:xxxI, ♂; Grissell, 1996: 278 .

Type material.— Six males and six females stand under this name in NHMW. Only the two males on the third and fourth mounts appear to be syntypes; they are conspecific. **Lectotype**, here designated, the ♂ on the third mount, labelled “Or. Ex. [Original Exemplar]; a tiny green square; Collect. G. Mayr; *Tor. congener* Förster, Type”. The male on the fourth mount, also with a tiny green square label, is designated **paralectotype**. The specimens are labelled as such.

Comments.— The lectotype and the paratype belong to *Pseudotorymus* and appear to be small specimens of *P. dubius* (Nees), 1834 (= *apionis* Mayr, 1874).

#### *Callimome femoralis* Perez, 1895

*Callimome femoralis* Perez, 1895:191-204, ♀.  
*Torymus femoralis*; Grissell, 1996: 199.

Type material not located. The description suggests it to be a *Pseudotorymus*.

#### *Torymus kaltenbachi* Foerster, 1840

*Torymus Kaltenbachi* Foerster, 1840: xxxI, ♀; Grissell, 1996: 282.

Original material not located. From the description, especially the clouded wing and dark body colour, we conclude that Foerster probably had female *Glyphomerus stigma* before him.

#### *Torymus tarsatus* Nees, 1834

*Torymus tarsatus* Nees, 1834: 71-72, ♂ ♀.

Original material lost. According to the description it is a *Pseudotorymus* and most probably *P. saphirinus* Boheman.

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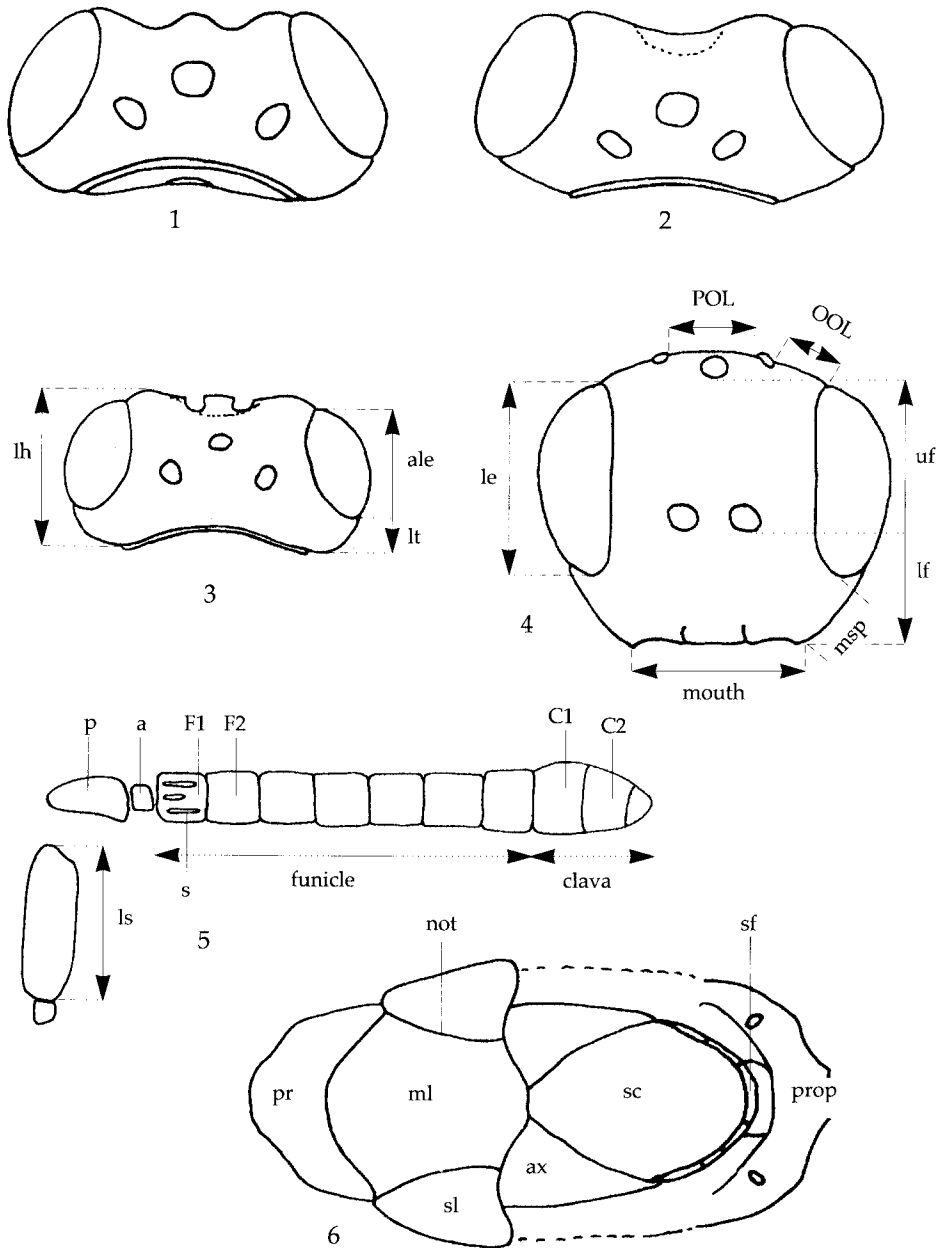
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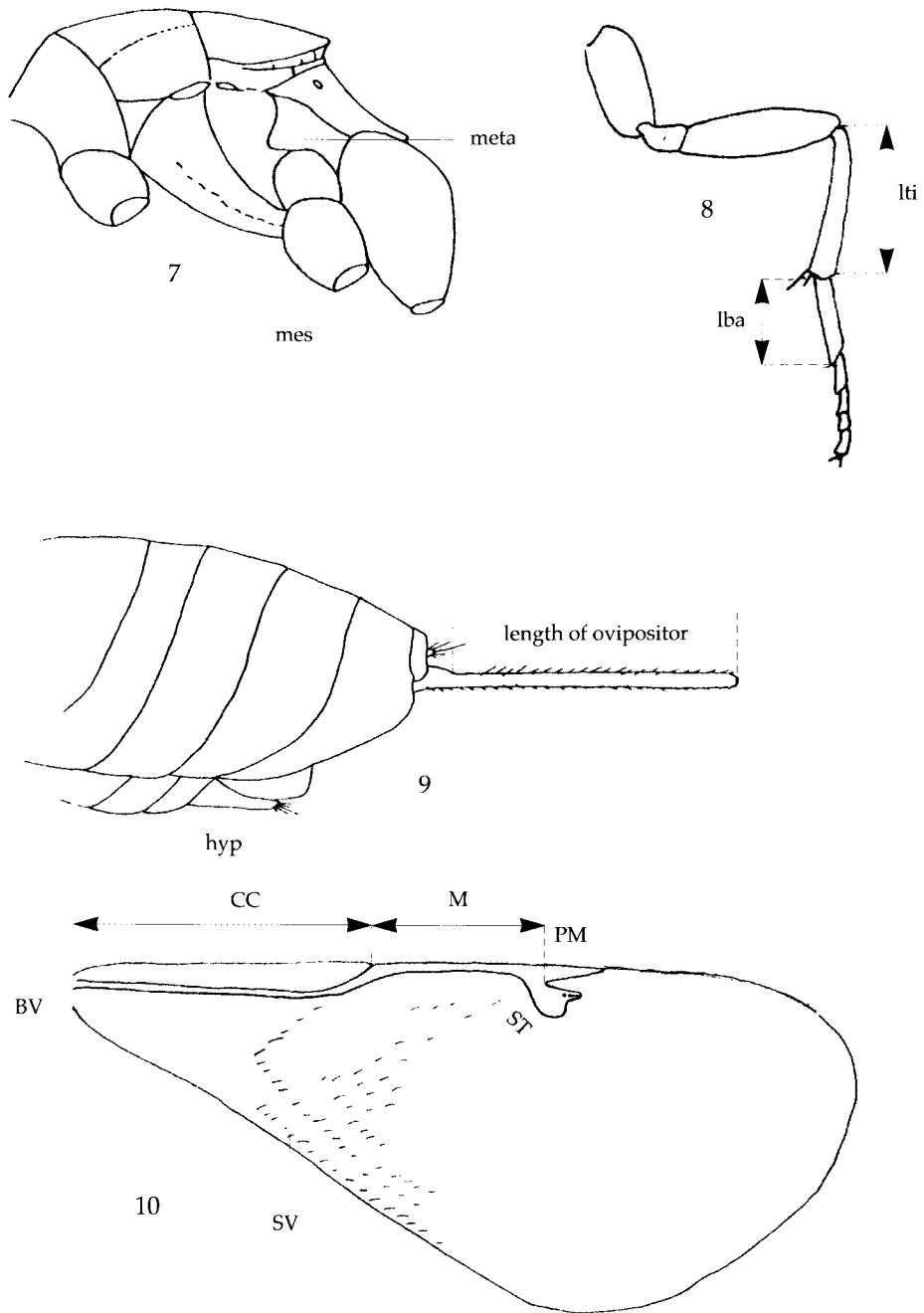
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#### Abbreviations used in figs 1-10.

a anellus, ale apparent length of eye, ax axillus, BV basal vein, C1, C2 claval segments, cc costal cell, F1, F2 funicle segments, hyp hypopygium, lba length of basitarsus, le length of eye, lf lower face, lh length of head, ls length of scape, lt length of temple, lti length of tibia, M marginal vein, mes mesepimeron, meta metapleuron, ml mid lobe of mesoscutum, m<sub>sp</sub> malar space, not notaulus, p pedicellus, PM postmarginal vein, pr pronotum, prop propodeum, PS parastigma, s sensilla, sc scutellum, sf scutellar flange, sl side lobe of mesoscutum, ST stigma, SV subcubital vein, uf upper face.

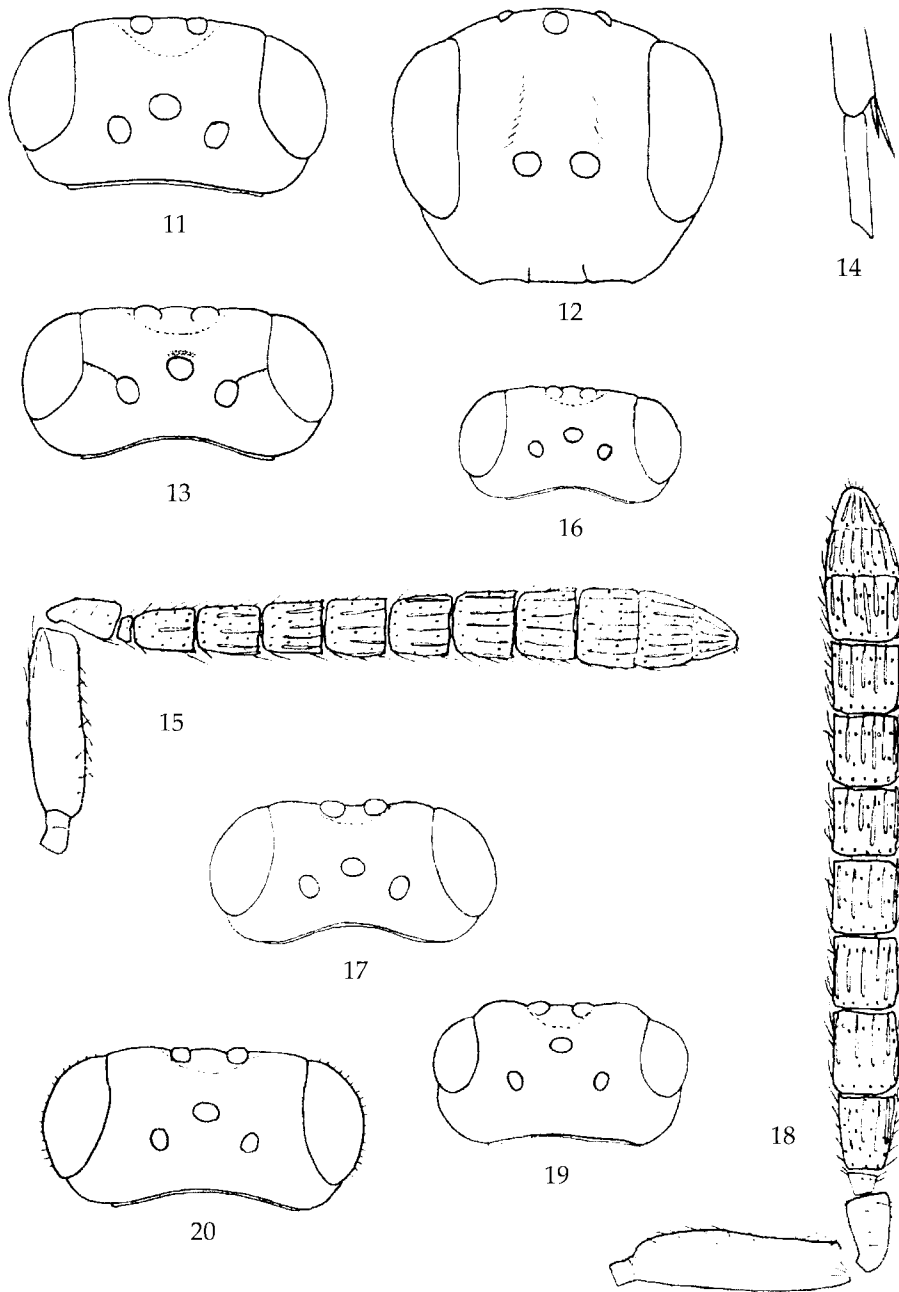


Figs 1-6, morphology. Fig. 1, wrong orientation of head; fig. 2, correct orientation of head; fig. 3, head, dorsal view; fig. 4, head, frontal view; fig. 5, antenna; fig. 6, mesosoma, dorsal view.

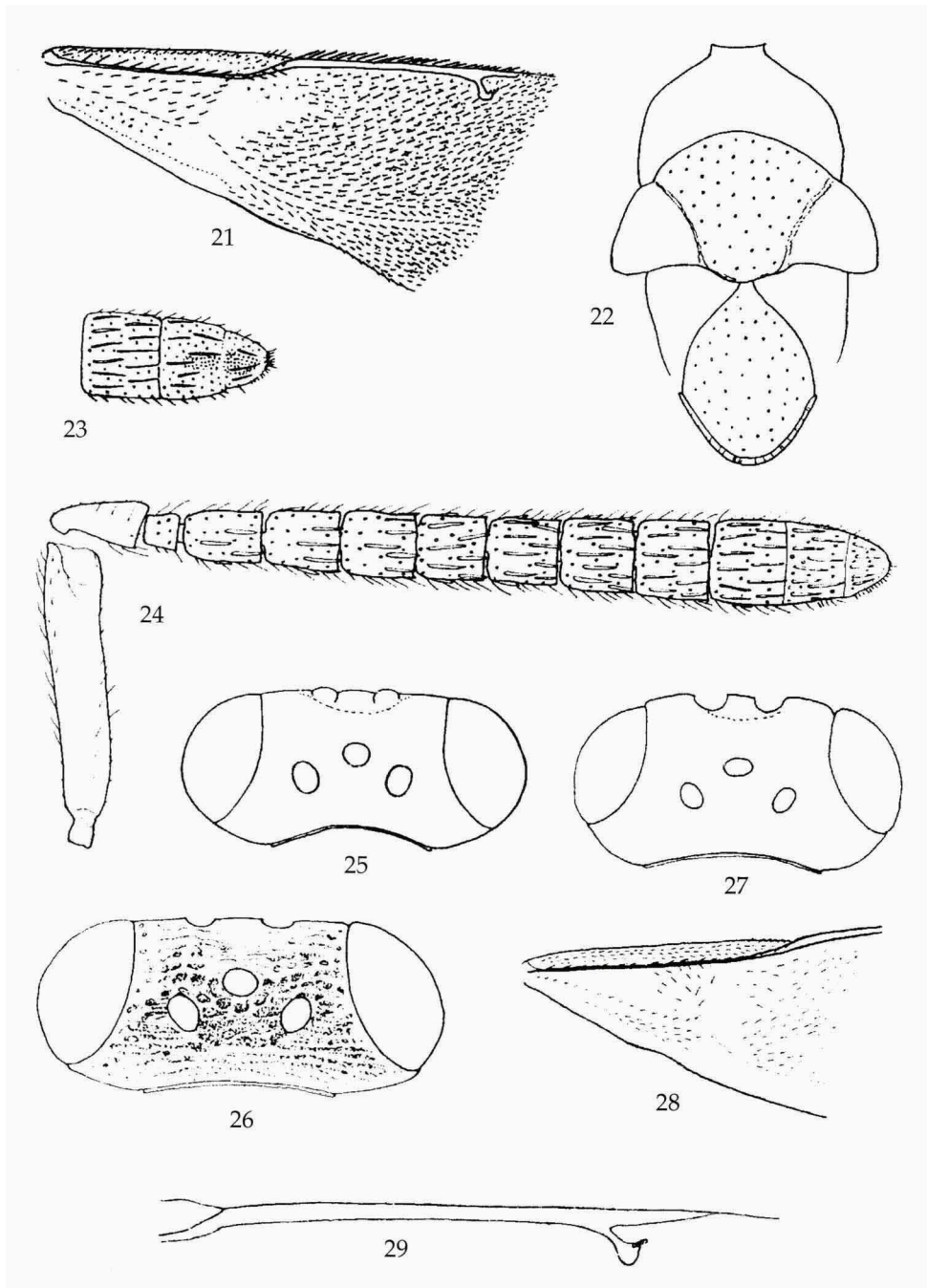


Figs 7-10, morphology. Fig. 7, mesosoma lateral view; fig.8, hind leg; fig 9, gaster; fig. 10, forewing.

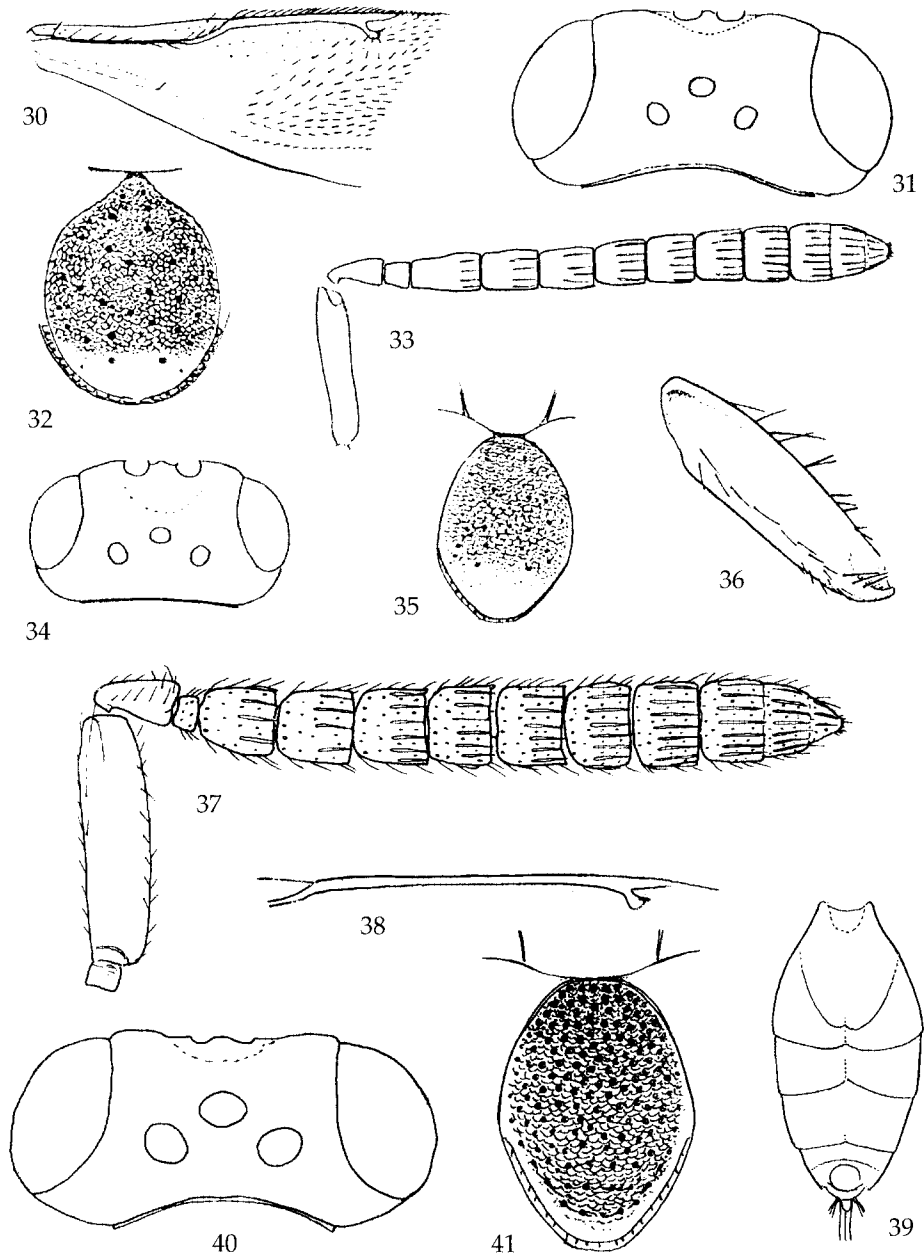




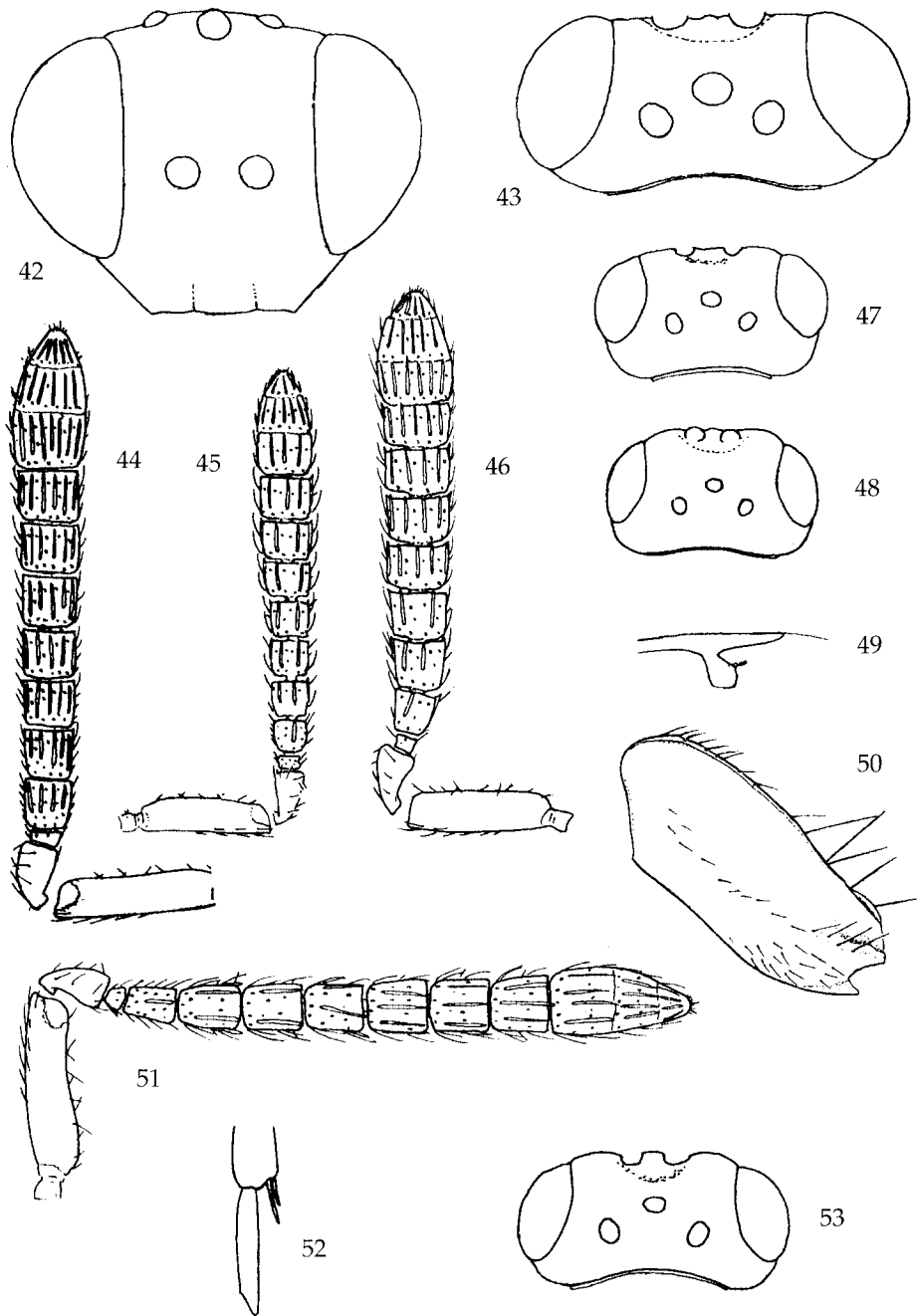
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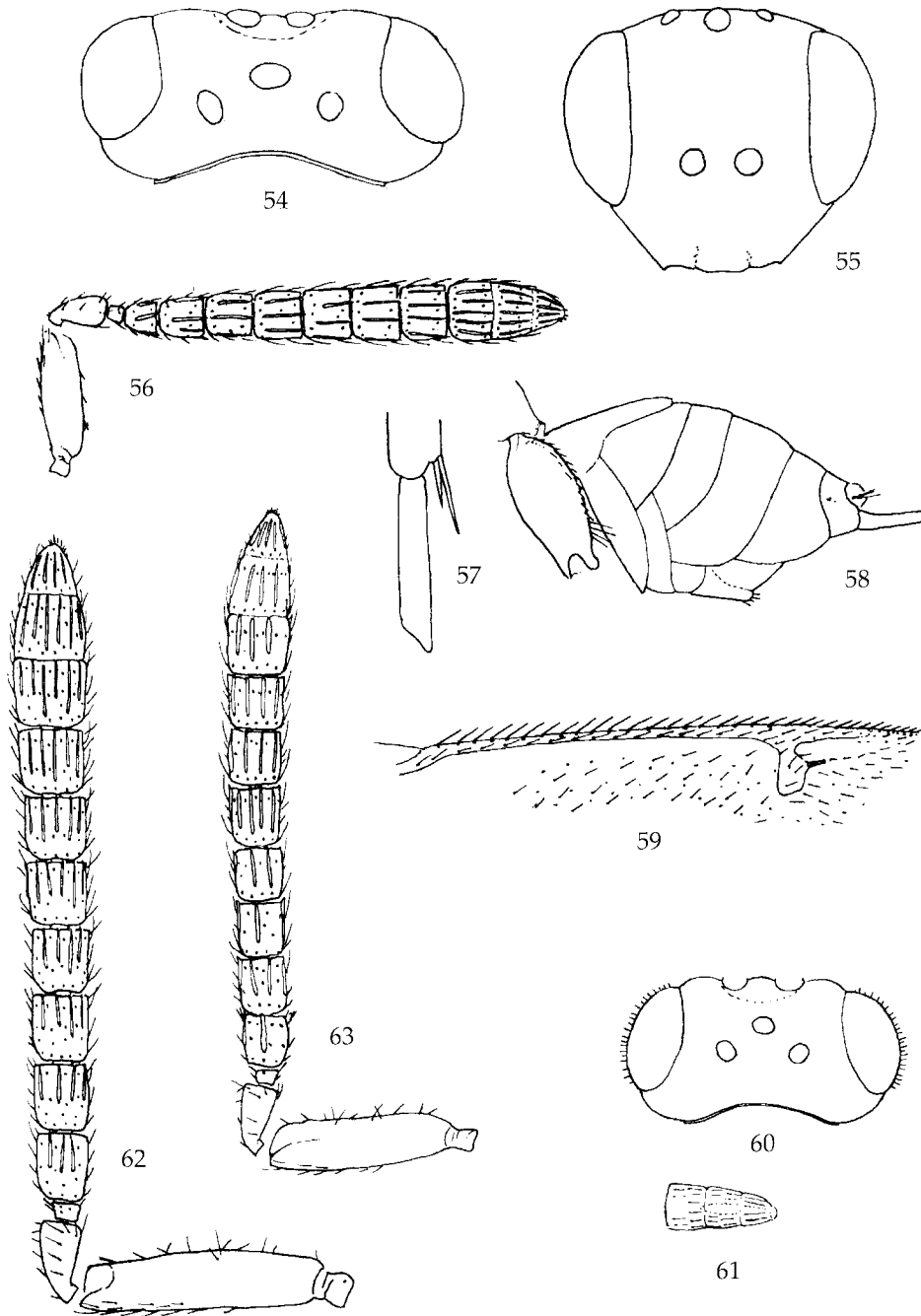
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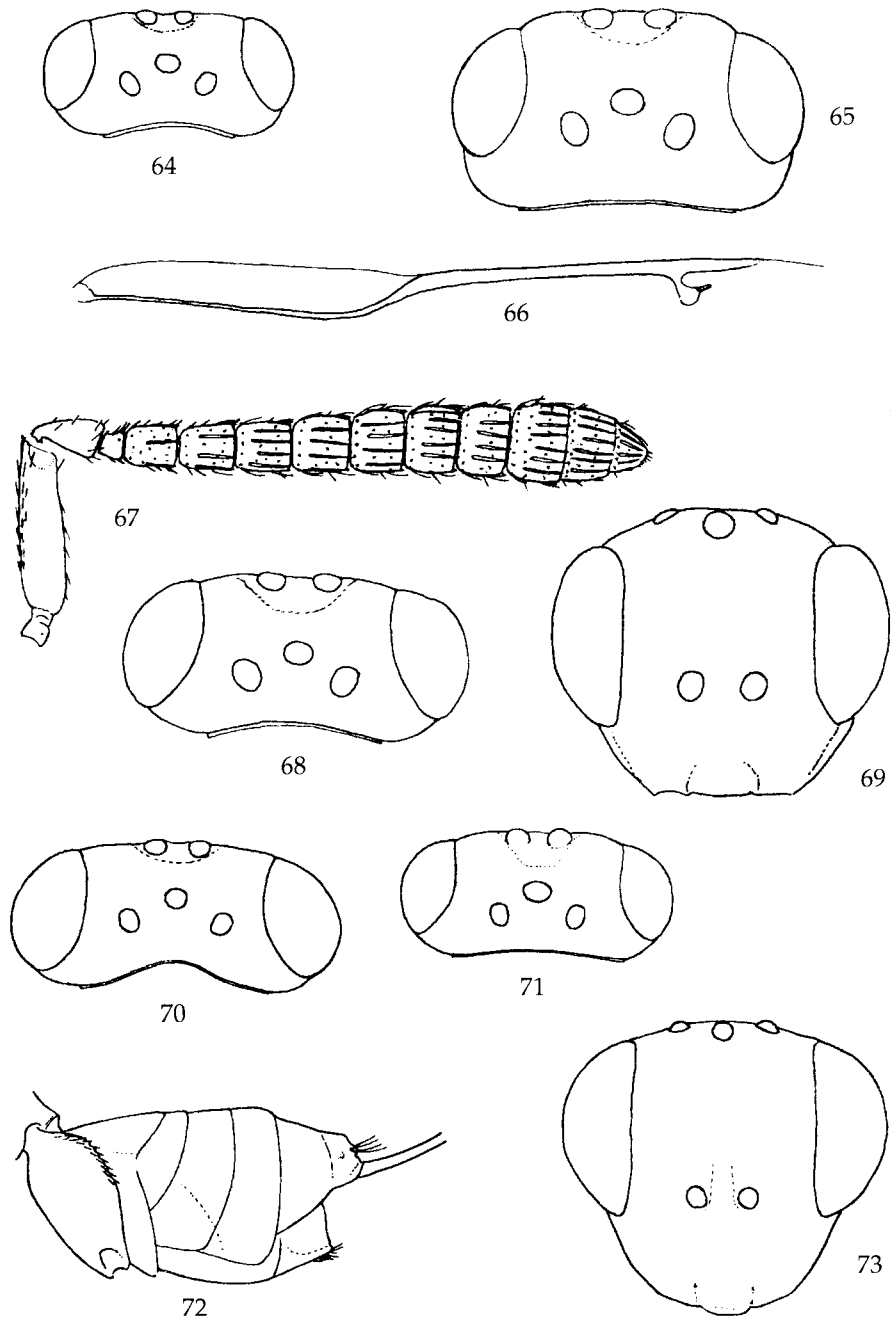
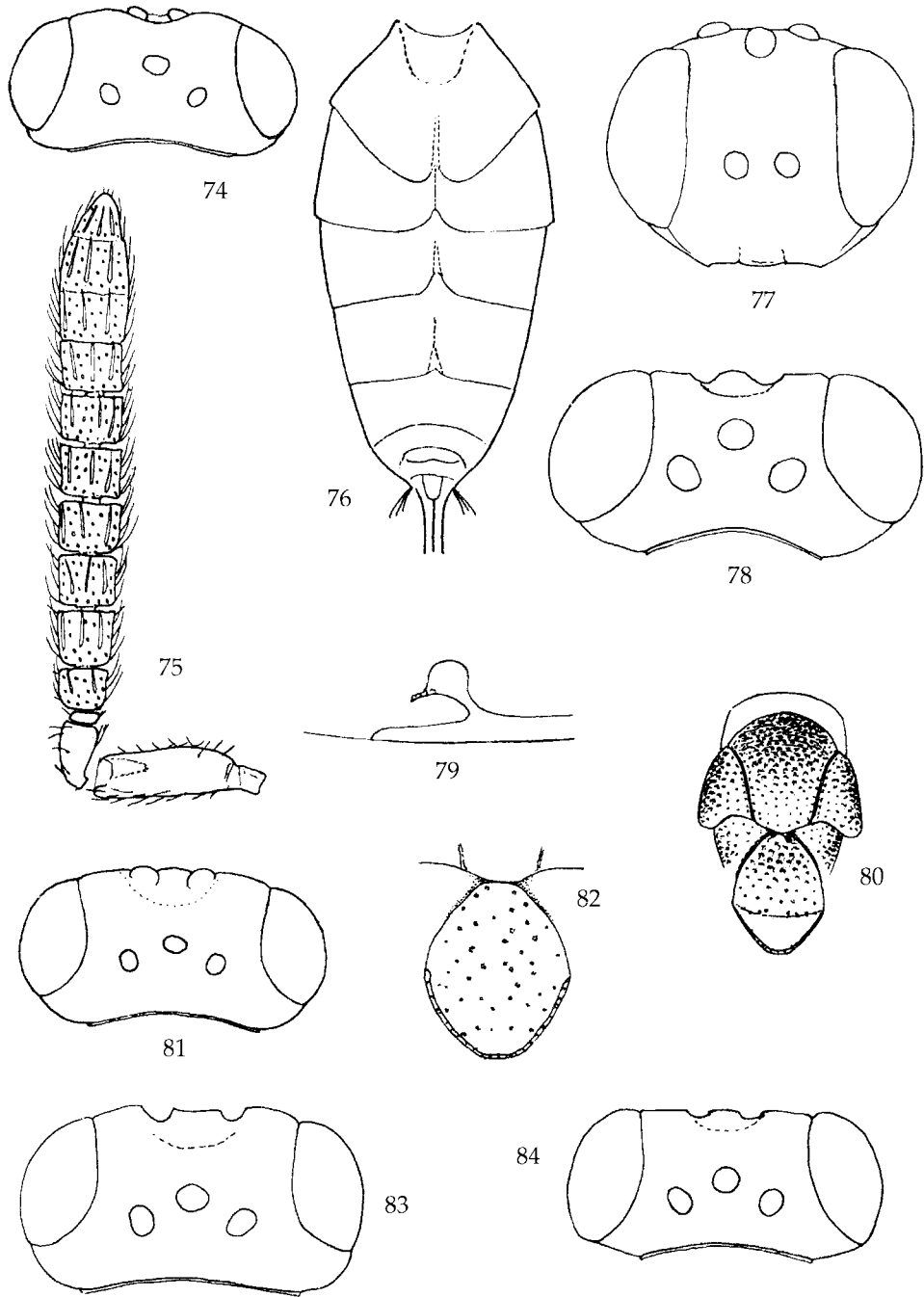
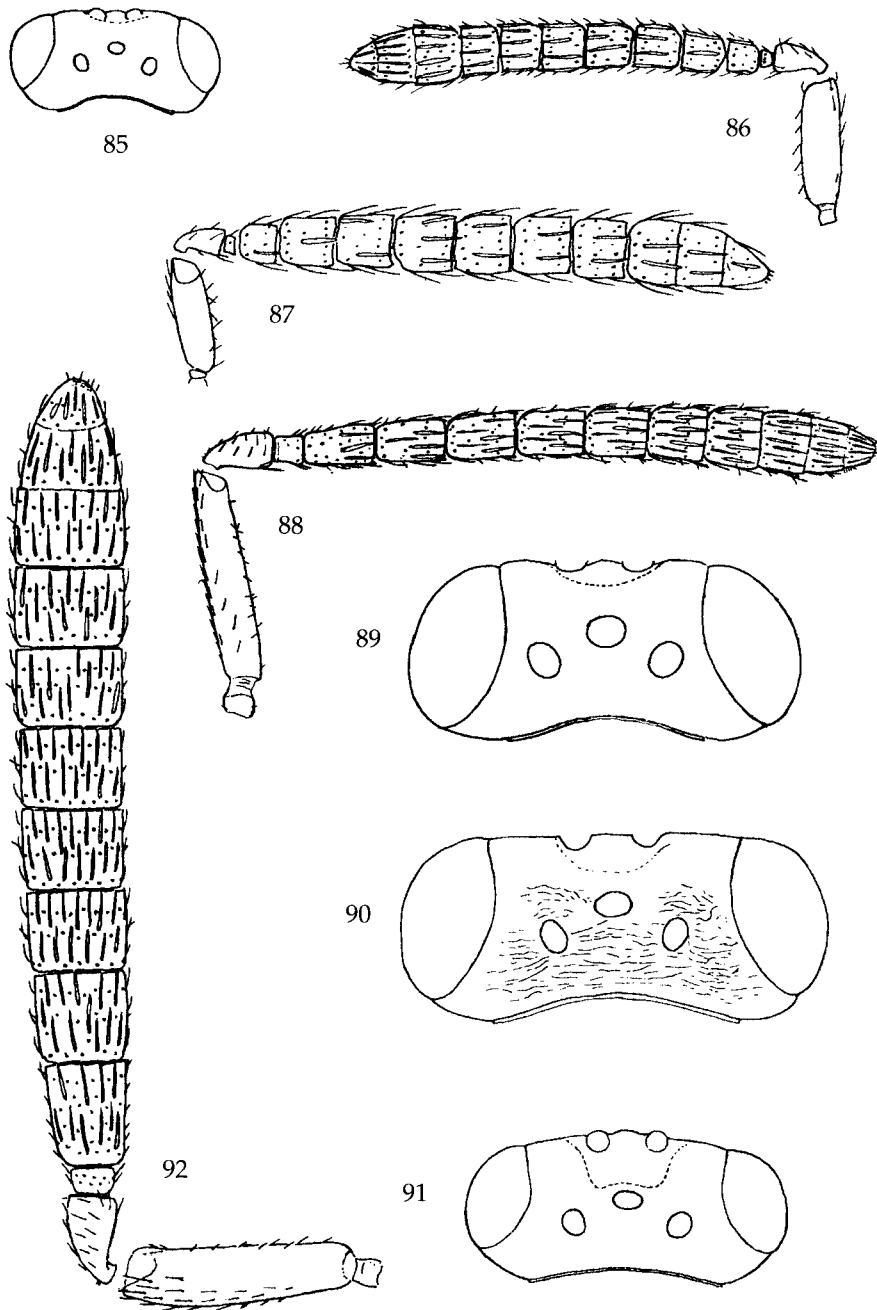


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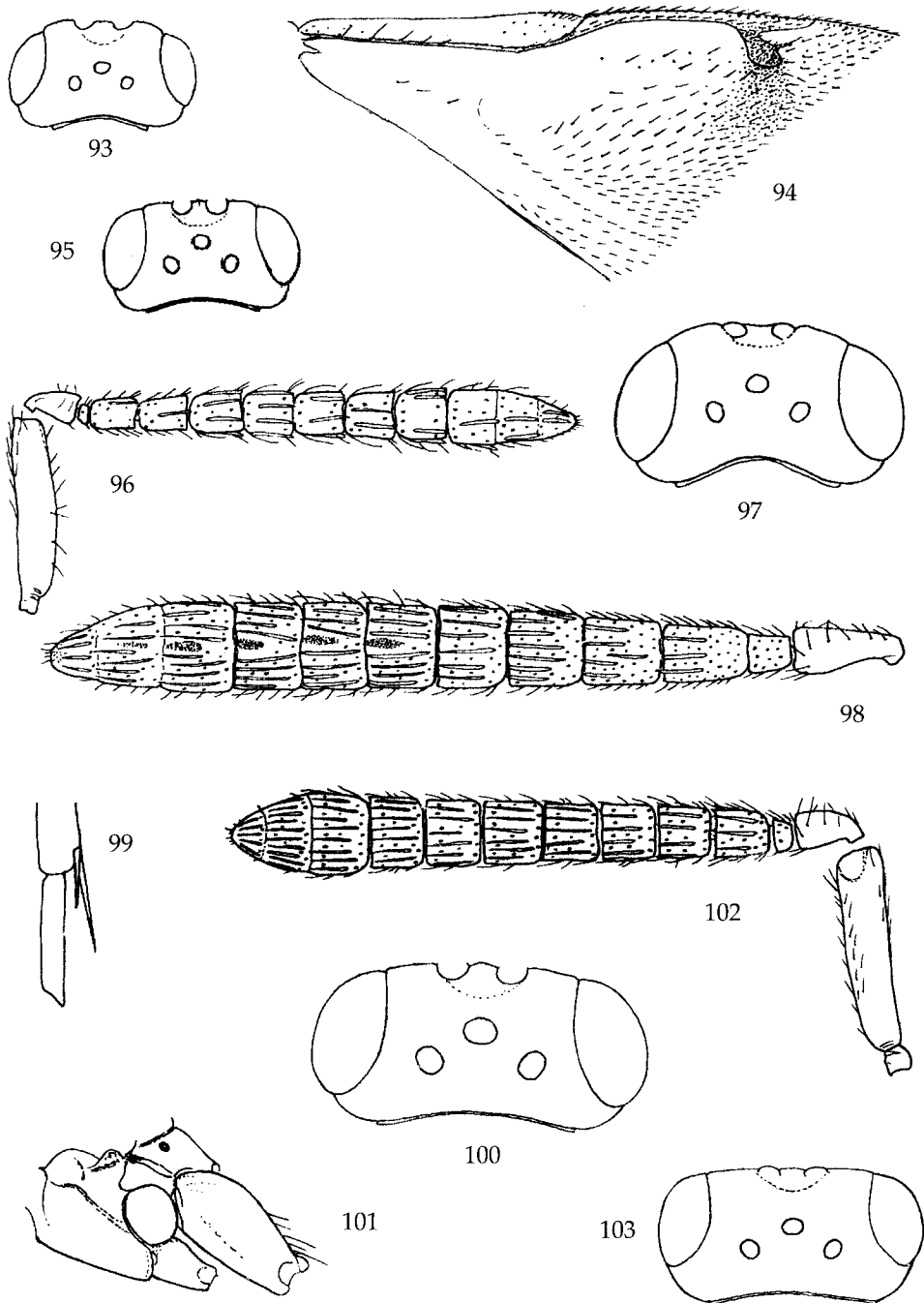


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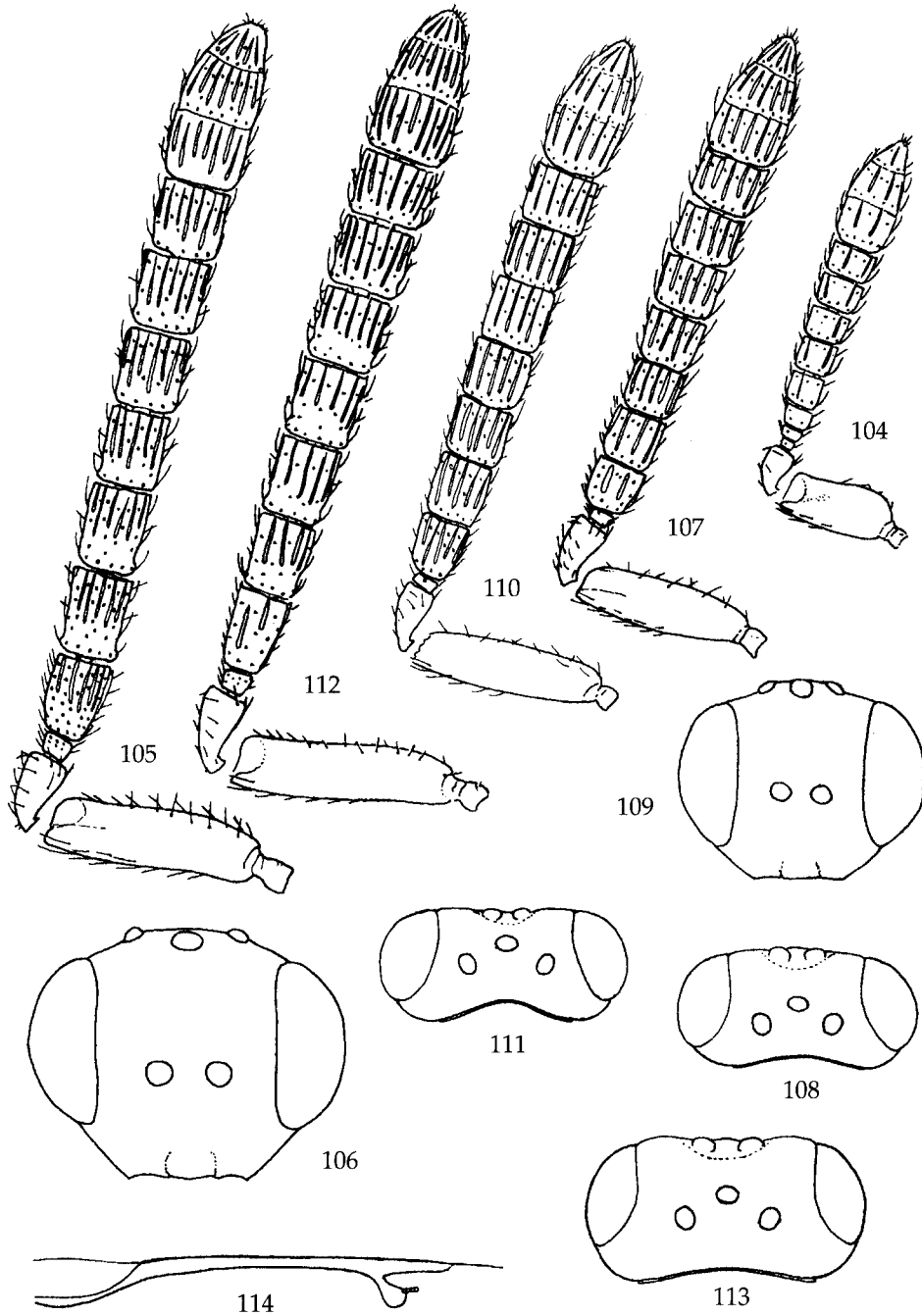


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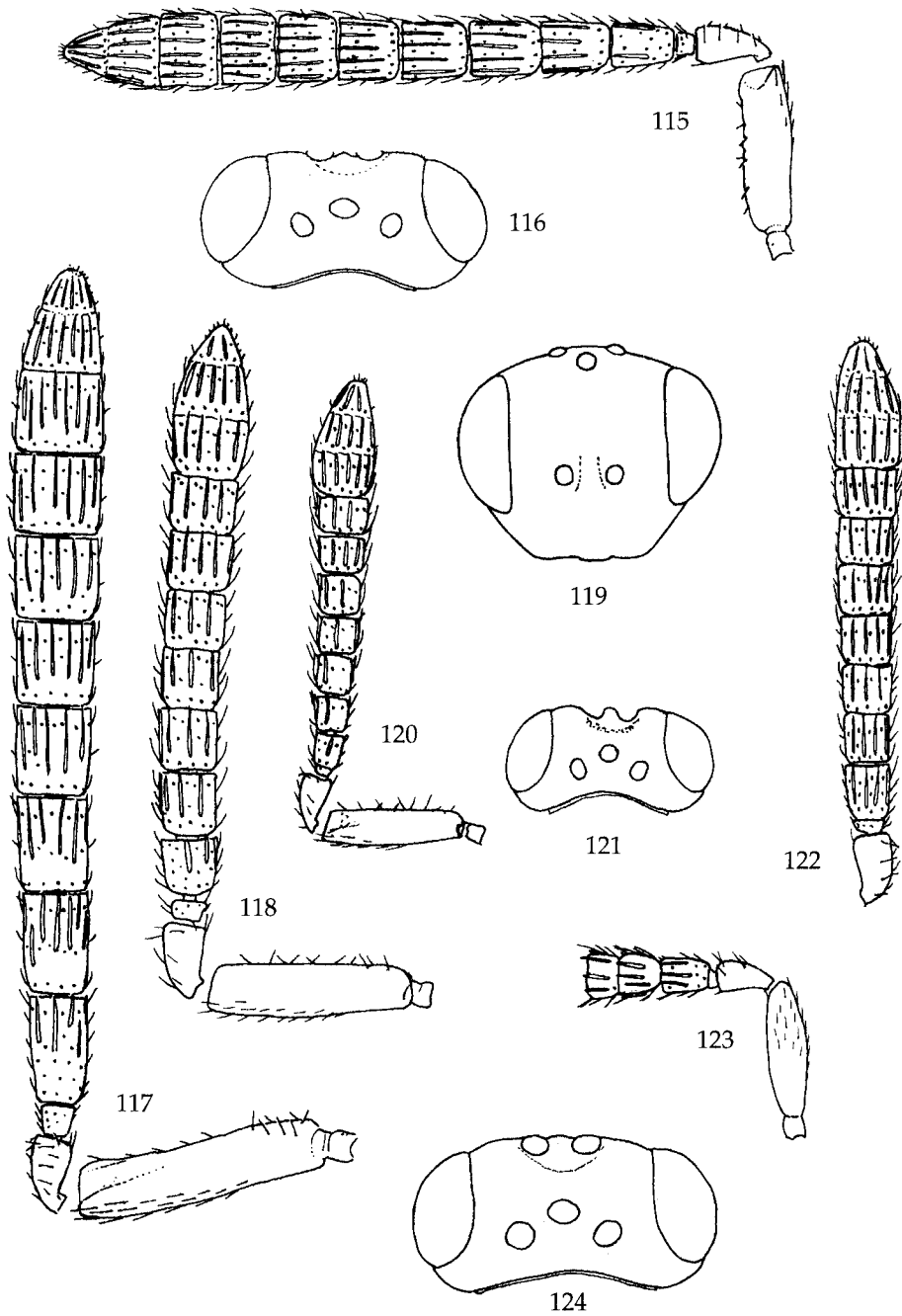
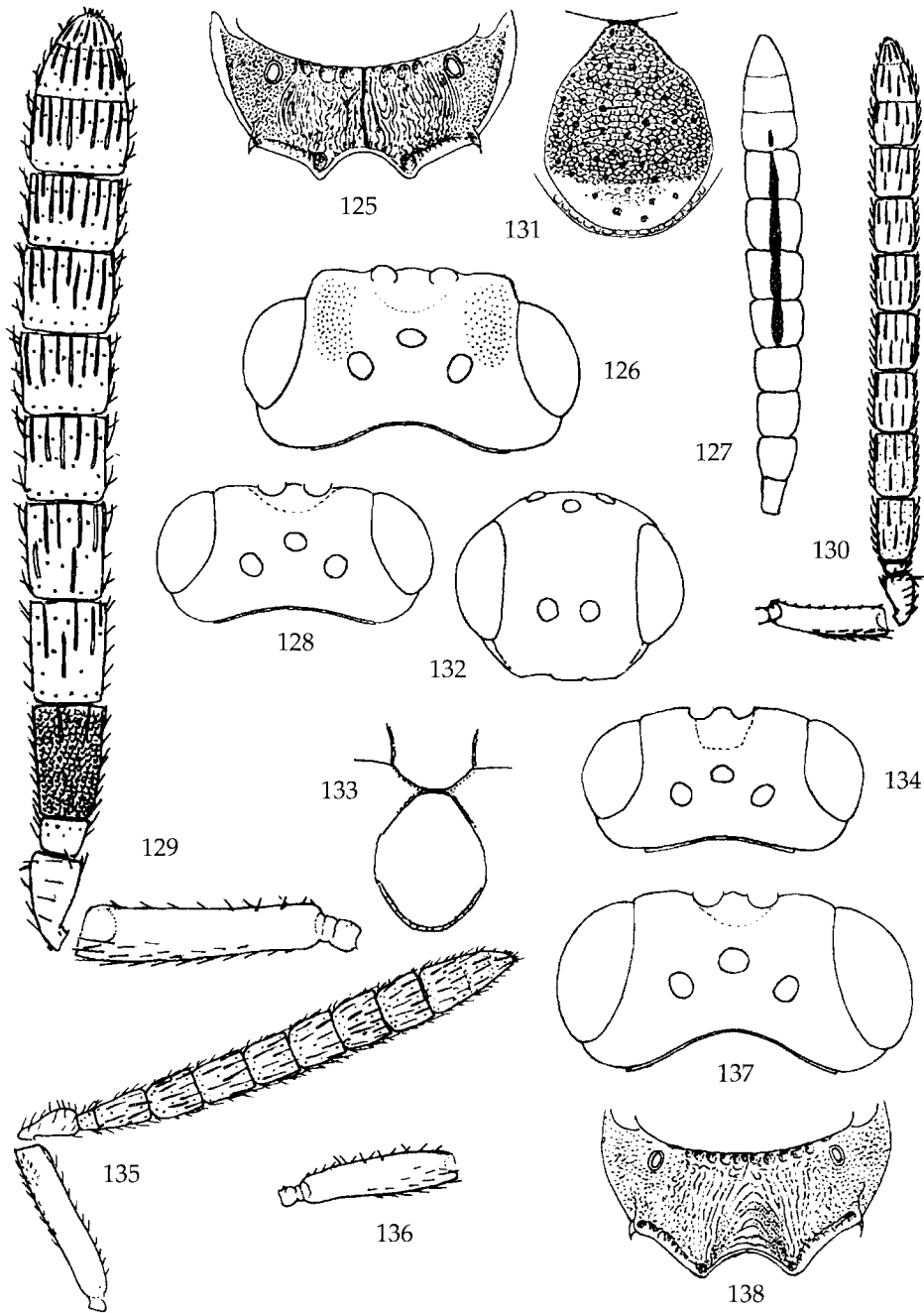


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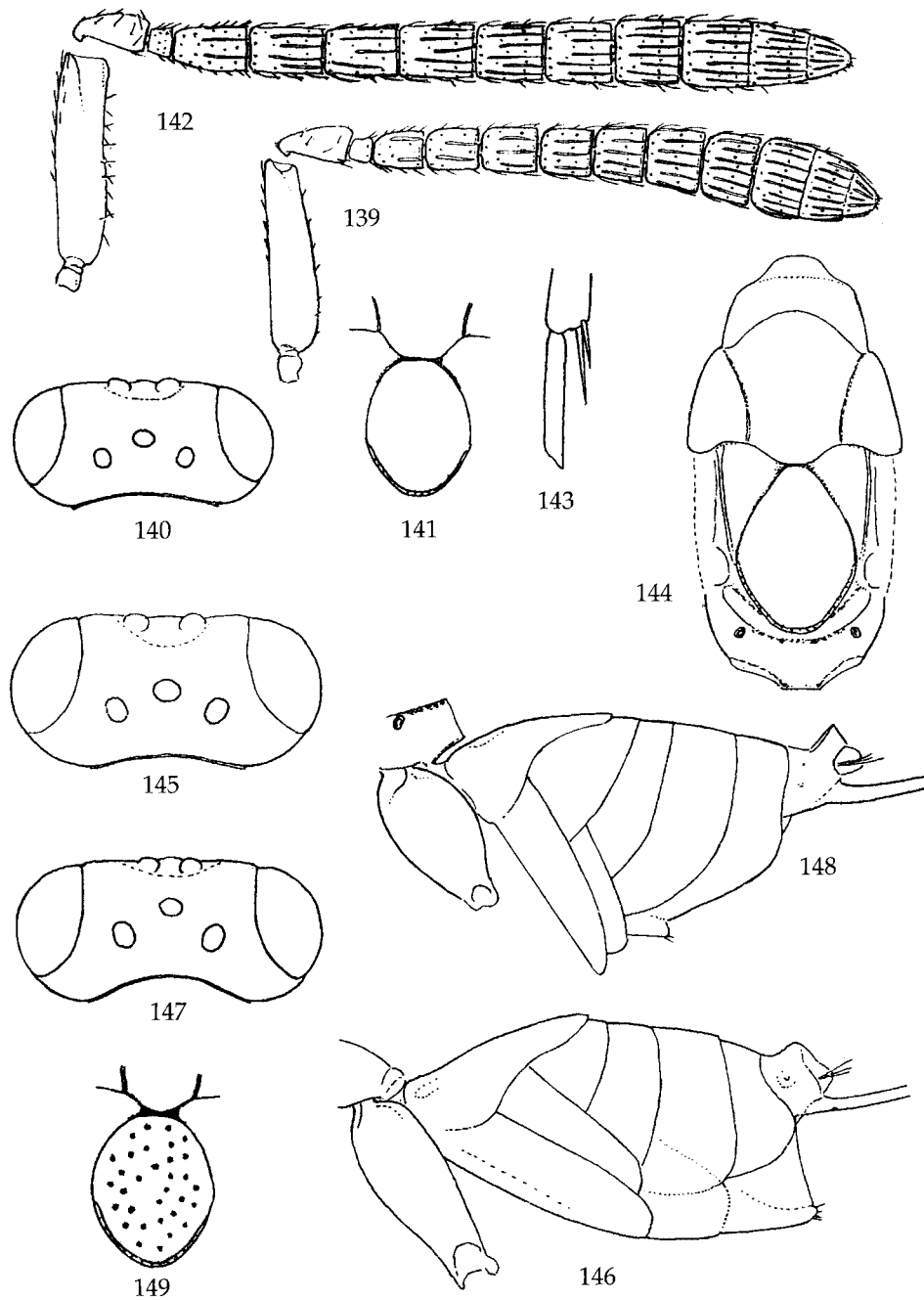


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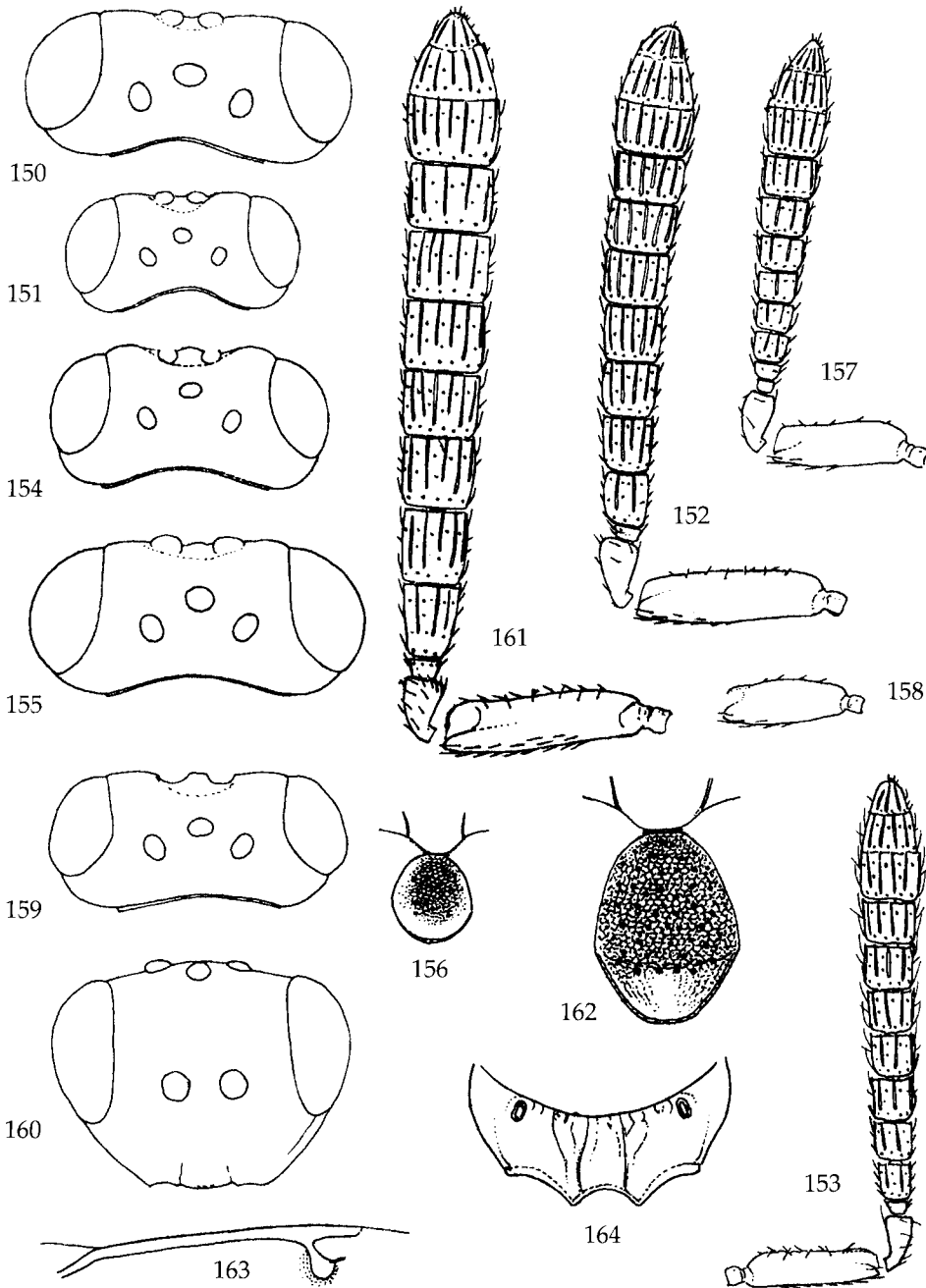


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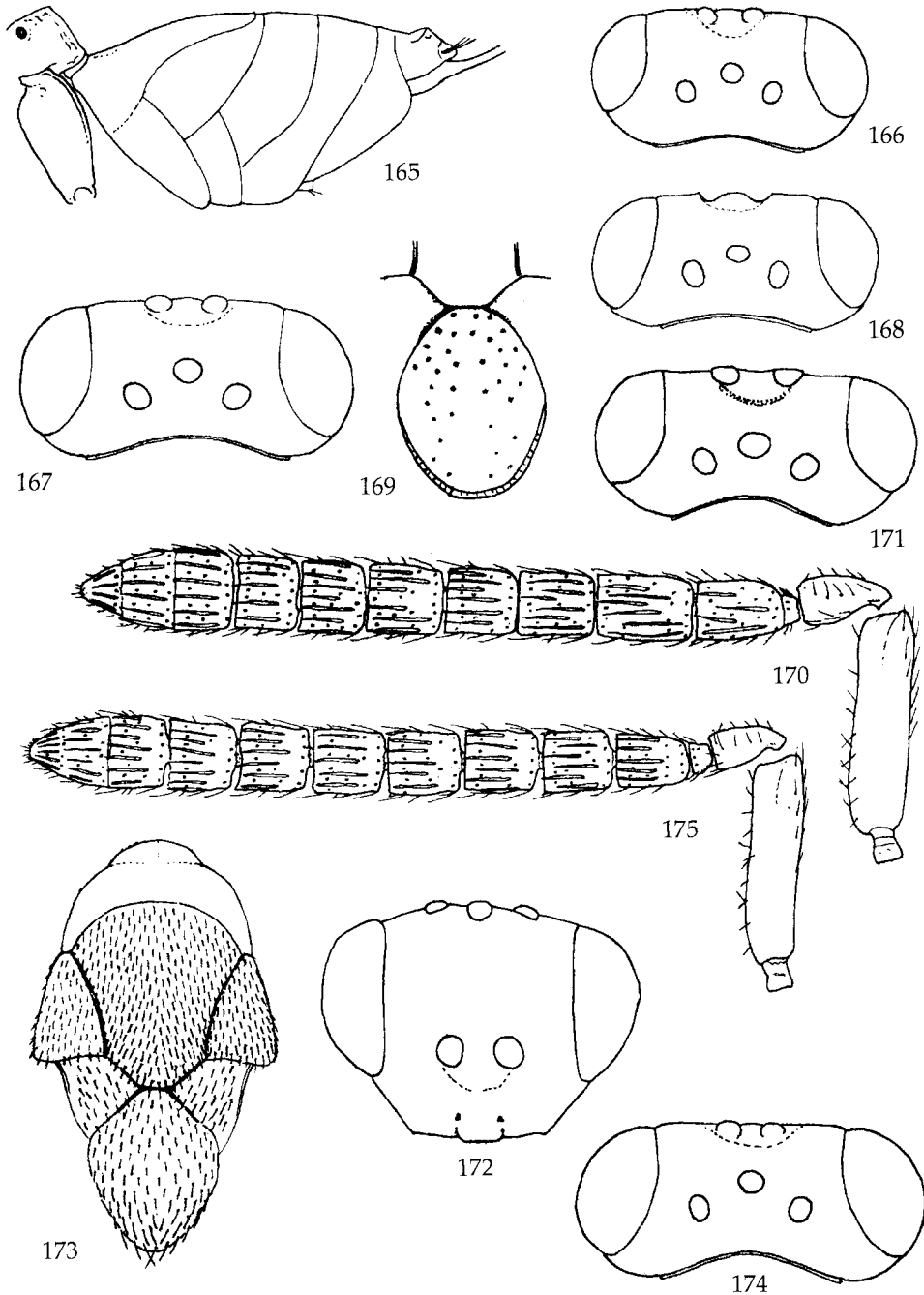
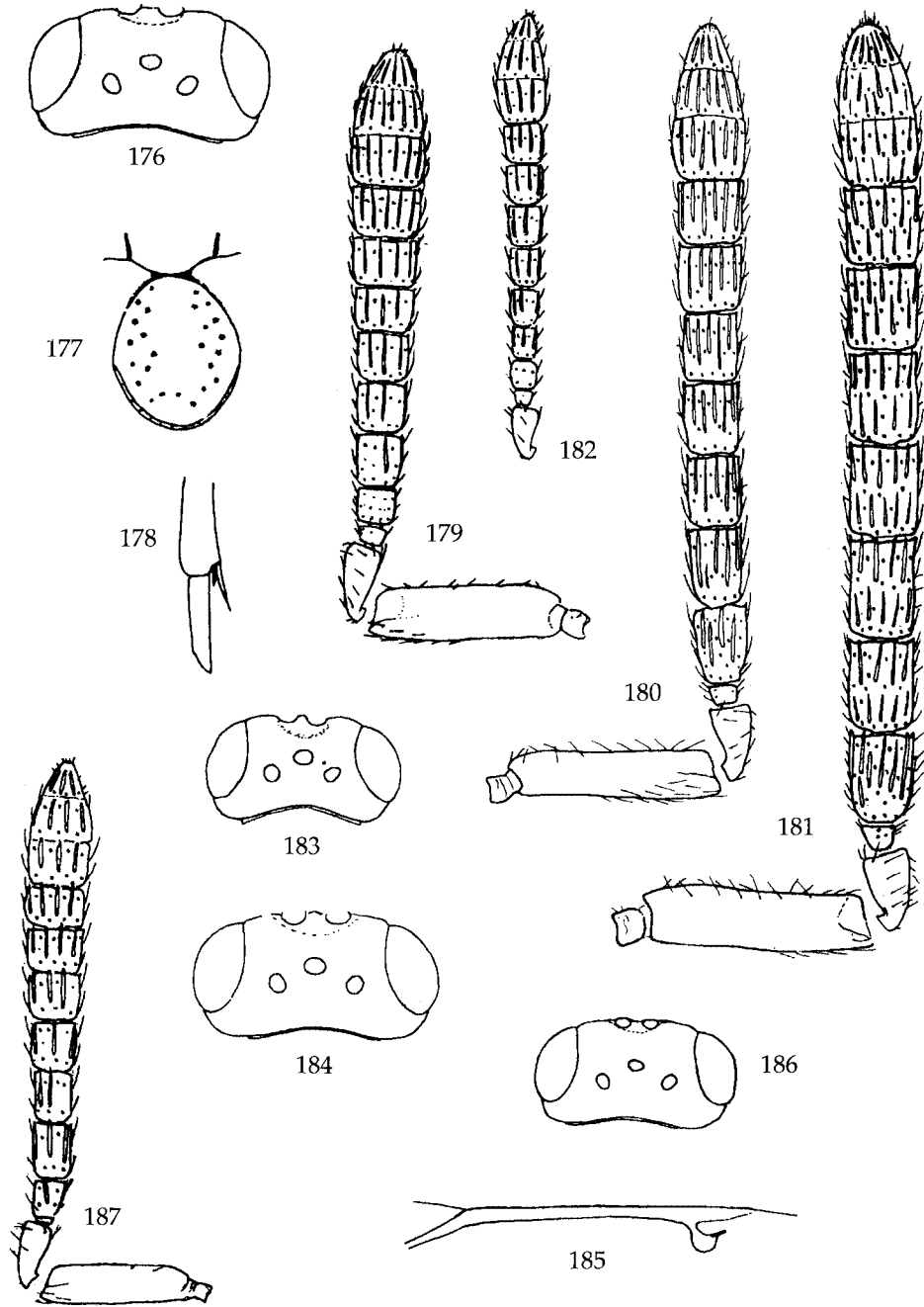


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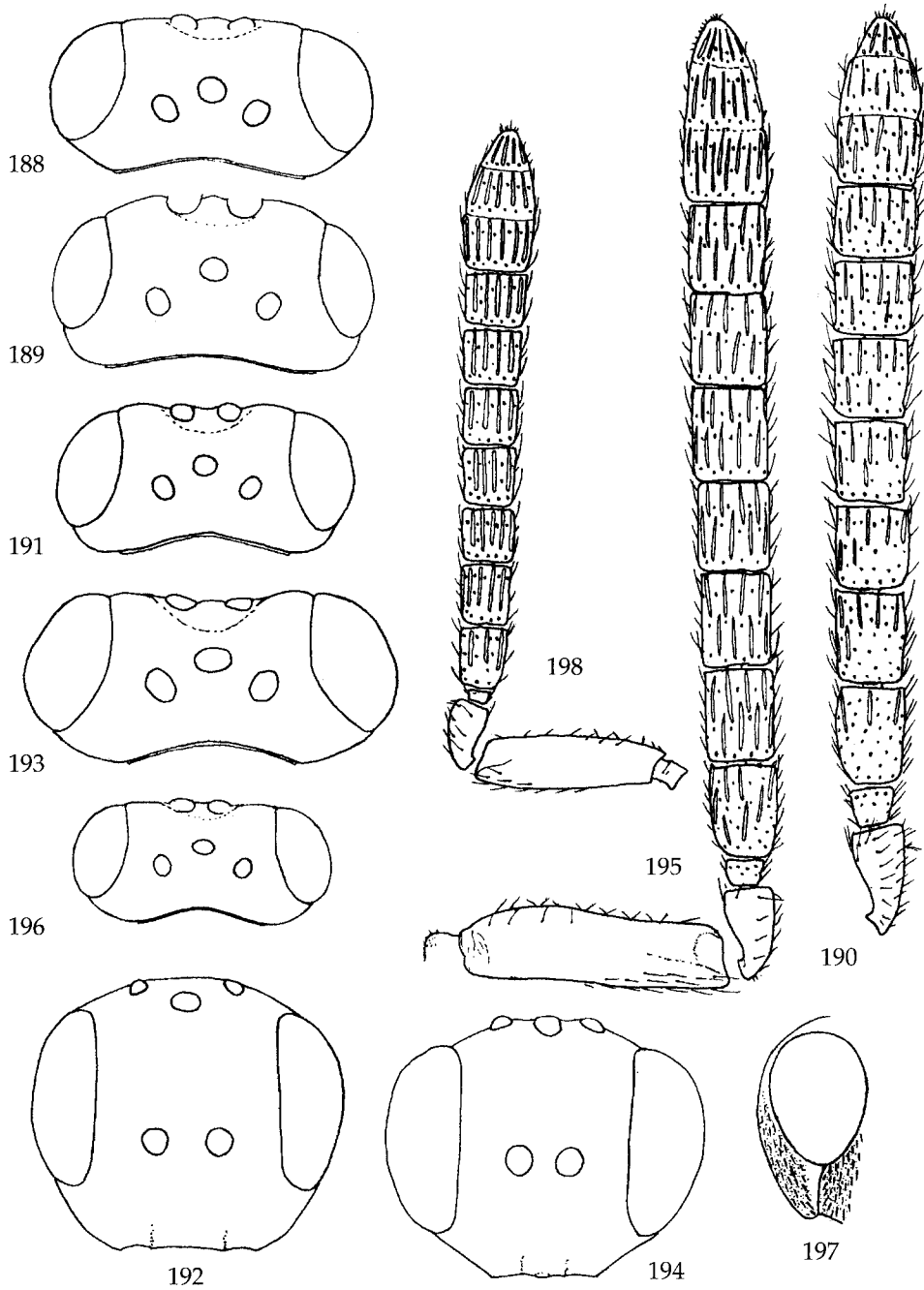
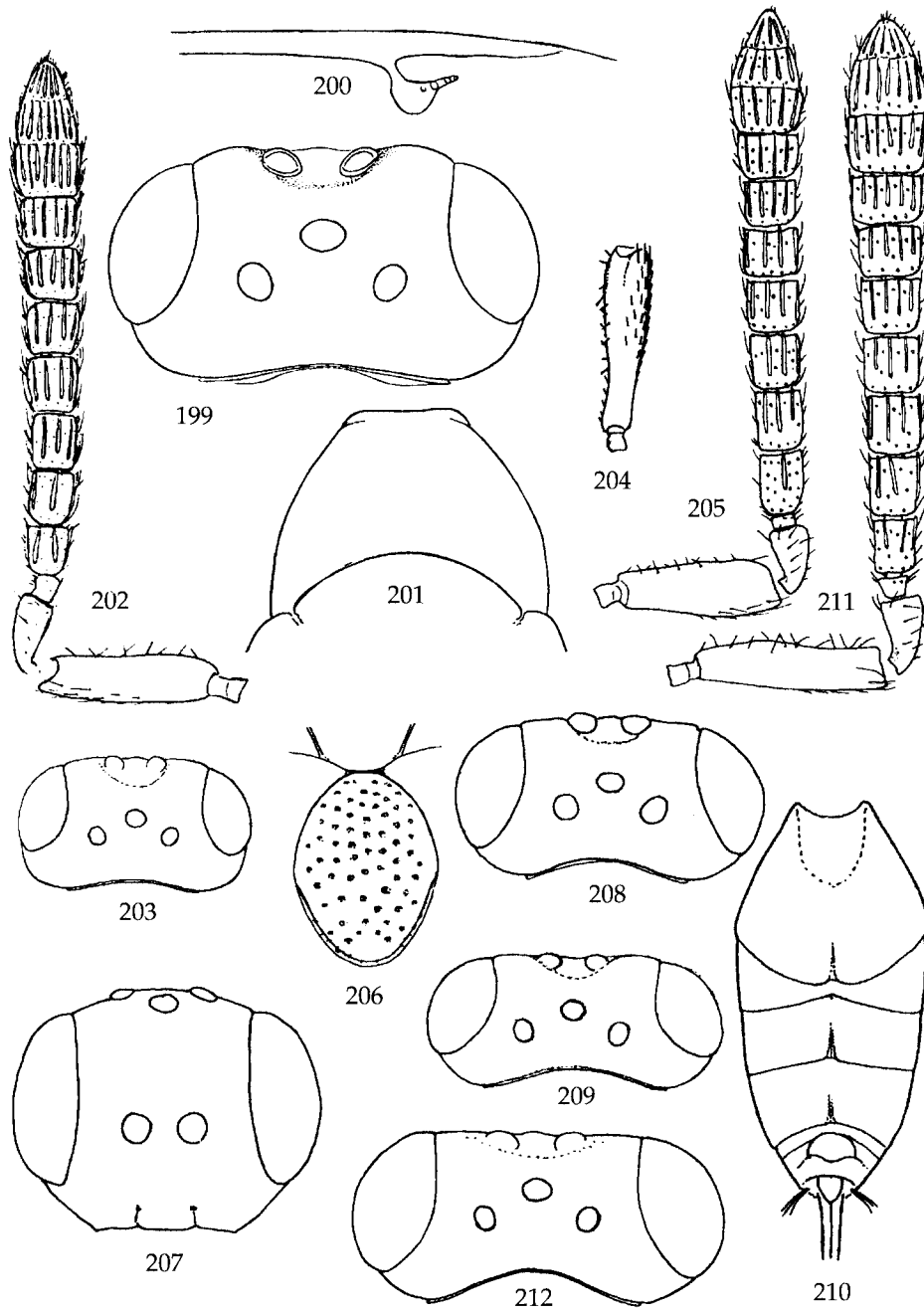
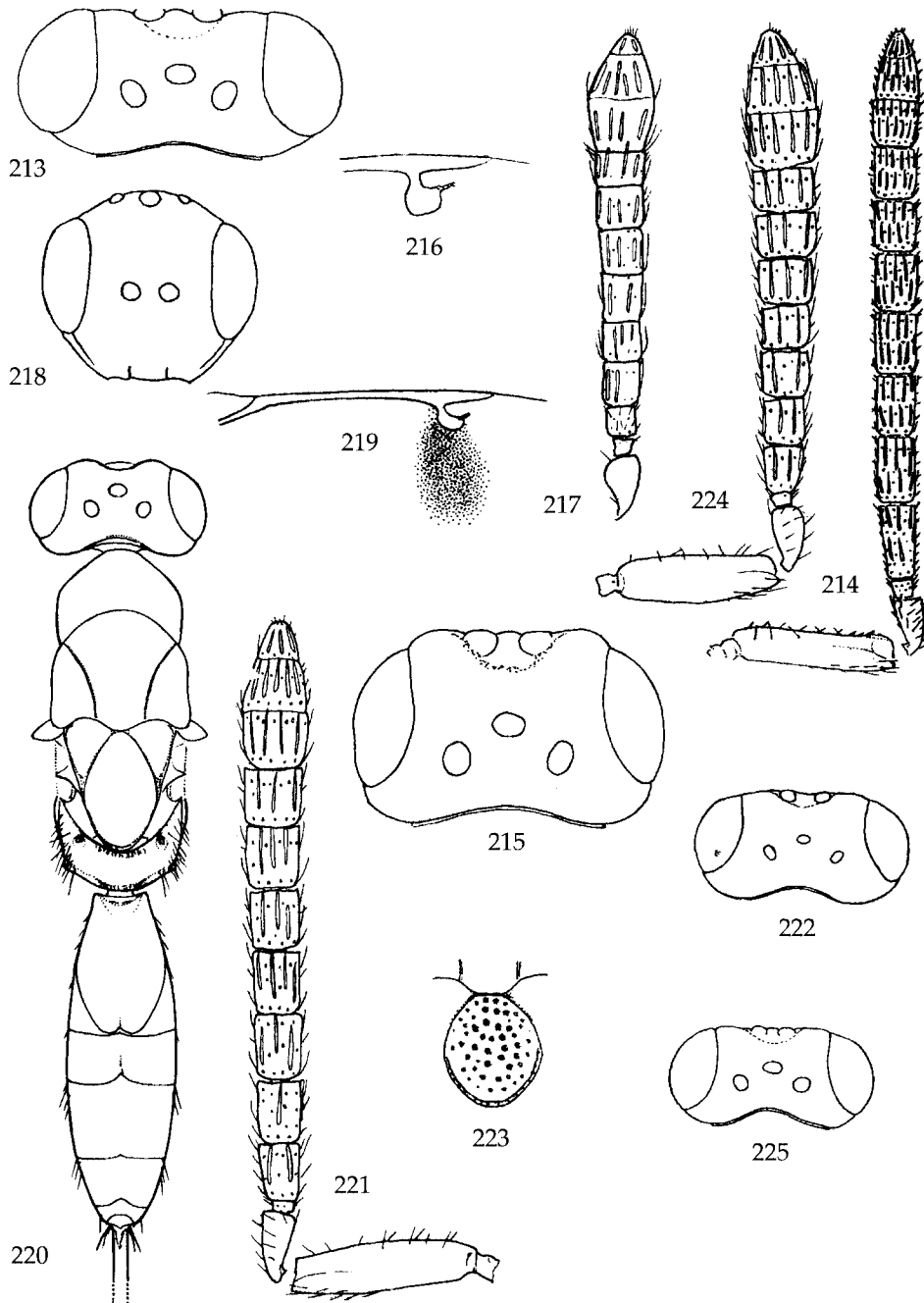


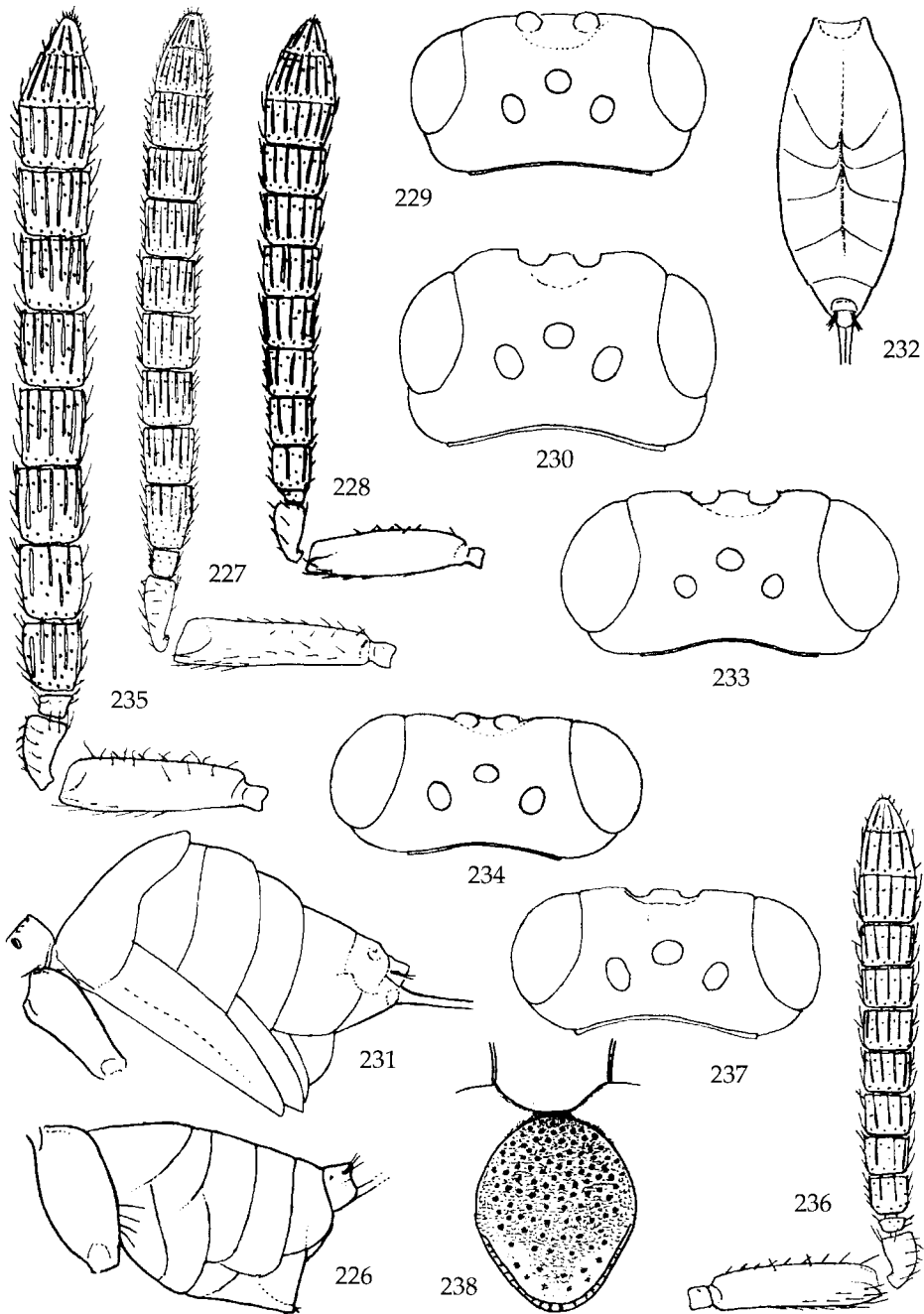
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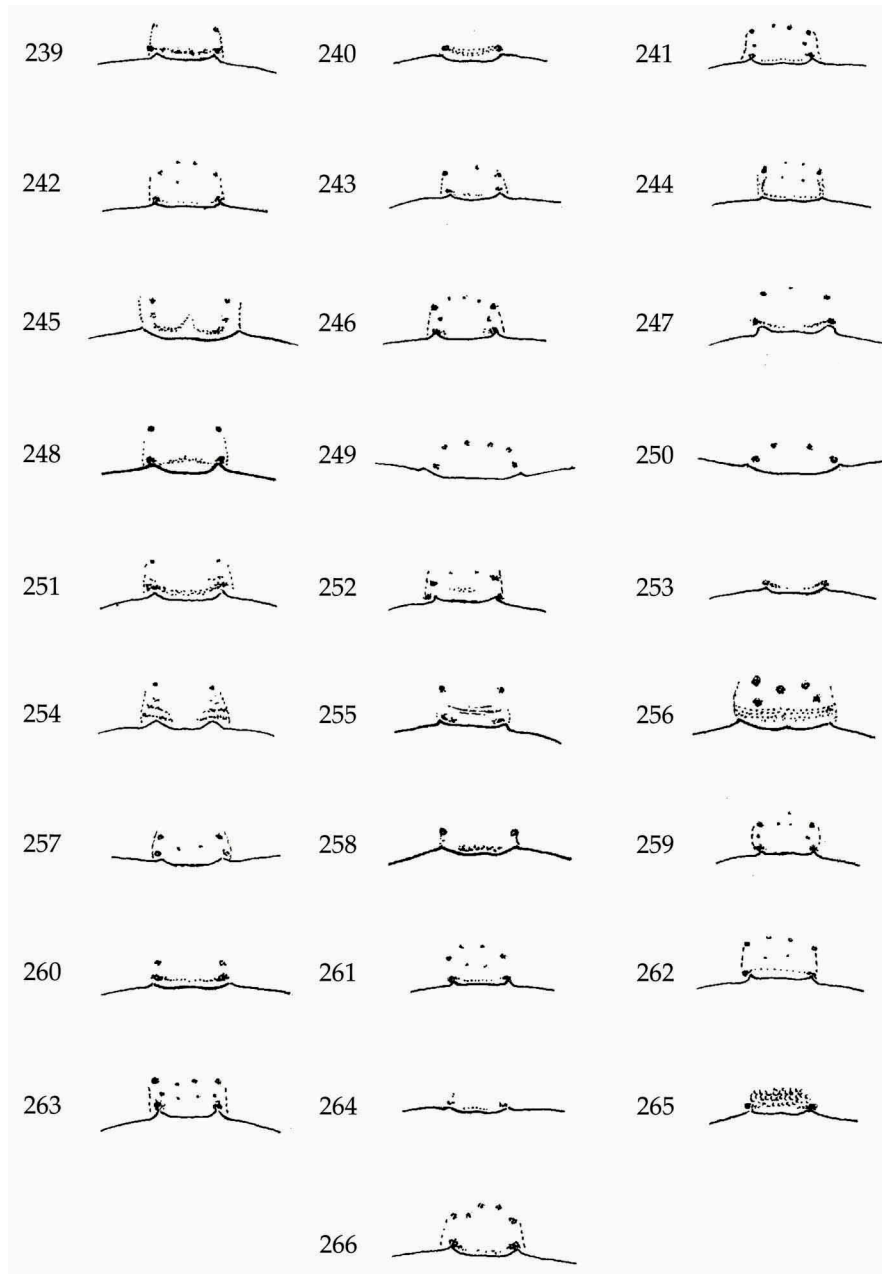


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<i>Cynipidae</i>		<i>chloromerus</i>
<i>Cynipoidea</i>	<i>Quercus</i> spp.	<i>auratus</i>
<i>Cynipoidea</i>	<i>Quercus</i>	<i>notatus</i>
<i>Diastrophus rubi</i>	<i>Rubus</i>	<i>rubi</i>
<i>Diplolepis eglanteriae</i>	<i>Rosa</i>	<i>eglanteriae</i>
<i>Diplolepis rosae</i>	<i>Rosa</i>	<i>rubi</i>
<i>Diplolepis</i> spp.	<i>Rosa</i>	<i>bedeguaris, microstigma</i>
<i>Dryocosmus australis</i>	<i>Quercus</i>	<i>favardi</i>
<i>Dryomyia circinans</i>	<i>Quercus</i>	<i>longicalcar</i>
<i>Dryomyia concinna</i>	<i>Acer</i>	<i>longicalcar</i>
<i>Lasioptera rubi</i>	<i>Rubus</i>	<i>eadyi</i>
<i>Liposthenus latreilli</i>	<i>Glechoma</i>	<i>cingulatus</i>
<i>Megastigmus brevicaudis</i>	<i>Sorbus</i>	<i>aucupariae</i>
<i>Pediaspis aceris</i>	<i>Acer</i>	<i>longicalcar</i>
<i>Phanacis lapsanae</i>	<i>Lapsana communis</i>	<i>lapsanae</i>
<i>Sphecidae</i>		<i>armatus, calcaratus,</i>
	<i>cupreus</i>	
<i>Synophrus politus</i>	<i>Quercus</i>	<i>cerri</i>
<i>Trigonaspis megaptera</i>	<i>Quercus</i>	<i>fastuosus</i>
<i>Wachtliella rosarum</i>	<i>Rosa</i>	<i>boops</i>
<i>Tetramesa</i> spp.	<i>Calamagrostis</i>	<i>baudysi</i>
Plantae		
seeds	<i>Crataegus</i>	<i>varians</i>
seeds	<i>Sorbus</i>	<i>druparum</i>